TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 11.

LEPROSY.

DE SOUZA-ARAUJO (H. C.). **The Leprosy Problem in Brazil.**—*Amer. Jl. Trop. Med.* 1925. May. Vol. 5. No. 3. pp. 219–228.

The author states that 10,000 lepers are known in Brazil, but he estimates the true number at 24,000. No active steps to deal with the problem were taken until 1921, when a Leprosy Board was appointed, which in 1923 issued an excellent series of regulations. He agrees with former writers in finding the States of Para, Minas Geraes and S. Paulo to be most infected, and gives figures and data regarding other States. The construction of ten large agricultural leper colonies is to be gradually carried out, but with the present Government grants it will require 15 years to complete them. The regulations provide for compulsory notification and segregation, and the immediate separation of children born to lepers; the isolation at home of uninfective nerve lepers is permitted, and the return of all alien lepers to their native countries is provided for; all excellent measures. Segregated lepers may be treated by their own physicians at their own expense. Cohabiting of married lepers in the leprosaria is permitted.

Leonard Rogers.

LIMA (Atualpa Barboza). **A lepra no Ceará.**—*Arch. Brasileiros de Med.* 1925. Mar. Vol. 15. No. 3. pp. 107–116. With 2 figs.

The author undertook a very thorough investigation into the question of the prevalence of leprosy in Ceará. He examined bacterially each patient and a large number of suspects. As a result he found 428 cases in all, of whom by far the largest numbers, 151, were in Fortaleza, the next in order being Jaquariba-Mirim with 36 and Sobral with 27. There are two Dispensaries for treatment, one at Fortaleza and one at Sobral. Chaulmoogra oil by injection is employed, but, since the patients are not kept in hospital, the treatment is not as thorough and prolonged as is desirable. The results, in consequence, are far from satisfactory. [Details are not given.]

H. Harold Scott.

(K2758) P157/183 1,625 11/25 H & Sp Gp 52 61

FOWLER (Henry). **A Survey of Leprosy in China.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 584–590.

The author has collected all the available information by means of questionnaires and extensive travel, but finds it impossible to form even an approximate estimate of the number of lepers in the different provinces. It is clear that the hot southerly coast Provinces of Kwangtung and Fukien suffer most, and the neighbouring Yunan and Kwangsi, as well as the more northerly coast Provinces of Kiangsu and Shantung, and all the Yangtse central Provinces except Anhwei are widely infected ; extensive areas in the north and west are reported to be practically free from indigenous cases, including Chihli and Manchuria, and probably Mongolia and Sinkiang. With the exception of the southern Kwangtung, Kweichow and Fukien Provinces no attempt is made to isolate even in villages the begging lepers, and the 20 leper settlements or asylums in these Provinces are all provided by Christian missions, who are trying to extend this work in Shantung and Yunan, for it is considered that " modern scientific methods, coupled with a form of voluntary segregation on the part of the lepers themselves, happily give good prospects of changing the entire outlook of China's lepers and ultimately ridding China of leprosy."

L. R.

CALLENDER (G. R.). **An Epidemiological Study in Leprosy.**—*Philippine Jl. Sci.* 1925. May. Vol. 27. No. 1. pp. 9–18. With 1 text fig. [2 refs.]

The author has carried out some inquiries on the conditions influencing the infection of leprosy, which are in close agreement with those of previous workers. Contact with another leper is admitted in 36·9 per cent., the patients often concealing the information to save relatives being segregated ; relative and non-relative contacts were noted in nearly equal numbers ; children and young people were most attacked, the age on the appearance of the first symptoms being below 20 years in 38·7 per cent., and men being more attacked than women. He found the average time between the first symptom and diagnosis to be 2·47 years, and that the first symptom in 78·2 per cent. was the appearance of anaesthesia ; the location of the first lesion was the exposed parts of the lower extremities in 81·5 per cent., 47 per cent. being on the feet, and if other exposed parts are added, such as the head, face and neck, the proportion was no less than 94 per cent., pointing to infection through the contact of leprous material with solutions of continuity of the skin surface. Approximately 5,000 lepers in the Philippines are segregated, and probably an equal number of cases are free, now mostly early ones.

L. R.

JASON (Jennie M.). **The Leper Colony of the Virgin Islands of the United States.**—*U.S. Nav. Med. Bull.* 1925. May. Vol. 22. No. 5. pp. 615–617.

A leper colony was opened in 1908 and was taken over by the U.S. Government with the three Danish Islands in 1917. It now has two physicians and a nurse for 70 lepers, the patients being surrounded by a wire fence and guarded, but work and modern treatment is provided.

L. R.

RAYNAUD (Lucien). **La lèpre en Algérie.**—*Bull. Office Internat. d' Hyg. Publique.* 1925. June. Vol. 17. No. 6. pp. 623–626. [7 refs.]

The writer states that in 1897, 58 lepers were known in Algeria, and the number is now estimated at about 150, some 50 being Musulmans and 62 Spaniards, most of whom have long been settled in the country. The only prophylactic measure enforced is the exclusion of foreign lepers. The patients are treated in skin clinics at the hospitals.

L. R.

COLOMBANI. **Note sur la prophylaxie de la lèpre au Maroc.**—*Bull. Office Internat. d' Hyg. Publique.* 1925. June. Vol. 17. No. 6. pp. 629–631.

In Morocco there are now 302 known lepers, about half in the Fez region. The disease does not appear to be increasing, although little is being done to check it. The author advises compulsory notification and the formation of several agricultural colonies for the isolation of the lepers and their families, together with complete isolation of infective cases and efficient treatment.

L. R.

ABBATUCCI (S.). **La médecine aux colonies françaises : prophylaxie de la lèpre en Indochine.**—*Presse Méd.* 1925. May 30. Vol. 33. No. 43. p. 723.

A recent census showed 5,813 lepers in Indochina, 4,454 interned in leper asylums or segregation villages, 283 under surveillance, 956 not interned and 301 awaiting internment. Ethel esters from *Hydnocarpus anthelmintica* prepared locally are being used, and are considered superior to imported preparations ; the results are satisfactory. The patients willingly continue the injections in the institutions, but free lepers often failed to return for them, so the authorities consider compulsory isolation is still necessary ; uninfective cases may be treated as out-patients. The sexes are segregated in the leprosaria, but not in the villages, where the separation of healthy infants born to the lepers is very difficult, since artificial feeding leads to almost certain death from gastro-enteritis.

L. R.

NOËL. **Prophylaxie de la lèpre dans les établissements français dans l'Inde.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 104–115.

This paper deals with leprosy in Pondichery, where efforts have been made to adopt the more humanitarian methods advised by the Strasbourg Leprosy Conference of 1923. They include modern treatment, numbering and registering the lepers, hygienic education, the appointment of a special inspecting officer to look after them, and medical officers, with equipment to treat them at the colonial hospitals on the lines advised by E. MUIR, while in future the leper asylums are to be called prophylactic hospitals.

L. R.

GRAM (H. M.). **Quelques indications sur la lèpre en Norvège.**—*Bull. Office Internat. d'Hyg. Publique.* 1925. June. Vol. 17. No. 6. p. 632.

The well-known prophylactic measures in Norway are briefly mentioned, and the present numbers are reported to be 78 in the leprosaria and 35 in their homes, or not more than 1 to 20,000 population, against nearly 2 per mille in 1857.

L. R.

GUILLÉN (Mauro). **La lepra en España.**—*Siglo Medico.* 1925. May 30. Year 72. Vol. 75. No. 3729. pp. 553–554.

Leprosy is endemic in the Canary Islands, and there are three main foci in Galicia, Andalucia and Levante. In the last-named the disease is present in the Provinces of Valencia, Alicante, and on from Tarragona to Barcelona. There is a leprosarium in Fontilles which has been of great service since its inauguration in 1909. The author holds with compulsory segregation of all lepers without exception in establishments commensurate as far as possible with the social status of the patients. At all institutions for dealing with the disease, apart from clinical and operation rooms, a laboratory is essential to ensure early diagnosis of cases, as it is largely, if not solely, in early cases that actual cure can be brought about.

H. Harold Scott.

BAUJEAN. **Prophylaxie et traitement de la lèpre à la Martinique.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 115–123. [1 ref.]

This small French island colony has long had a leper asylum on the tiny island Desirade, which is the terror of the patients. In accordance with recent advance, as elsewhere, this place is now being reserved for mutilated and infirm lepers, who are no longer amenable to treatment; the open infectious cases discharging lepra bacilli are treated in special isolation wards at the different hospitals until no longer contagious, while the uninfectious cases, not discharging bacilli from nasal or skin lesions, will be dealt with as hospital out-patients or under their own doctors, which will enable the early cases to come forward without fear of being sent to Desirade. These humanitarian measures may confidently be expected materially to reduce the incidence of the disease after some years. Ethel ester chaulmoogrates and other recent treatments are being used with good results.

L. R.

PUBLIC HEALTH REPORTS. 1925. May 8. Vol. 40. No. 19. pp. 928–930.—**Leprosy in the Philippines.**

This is a brief account of the work at Culion, to which an average of 1,000 lepers have been sent annually during the last 19 years. At first glance this does not appear to support the value of the measure, but the objection is answered by the fact that whereas at first the great majority of the lepers were advanced maimed cases, in recent years an ever-increasing number of early cases are admitted: "Incontestable evidence that segregation is becoming effective and

that a few more years of vigorous enforcement will stem the tide." About 5,000 remain at Culion, while a few hundred have been discharged in recent years on parole, nearly all since the improved treatments were given. The total death rate of the colony compares favourably with the average Filipino town, and " the results of improved methods of treatment seem to warrant the opinion that many cases of leprosy are curable ; " this has induced new hope in the lepers.

L. R.

MUIR (E.). **Report on a Visit to the Leper Island of Culion and on the Anti-Leprosy Work in the Philippine Islands.**—*Indian Med. Gaz.* 1925. June. Vol. 60. No. 6. pp. 261–264.

The author points out that in India, with 30 times the population, and probably three times the leper rate per mille, the problem is very different from that in the Philippines, where such important work has been done in the great Culion settlement, including much pathological research. He found very few cases of the first, pre-infective stage of leprosy, although a number of such cases are being treated in the recently opened Say Lazaro hospital at Manilla, where cases, not positive bacteriologically, are now admitted for treatment, the positive ones alone being sent to Culion, and he advocates the establishment of further leper clinics in the Philippine towns on the lines of those being opened in India. He indicates also the weak point of Culion, where so many infections of healthy children have taken place owing to their not being separated from their leper parents at birth, but this is likely to be remedied soon.

L. R.

GRAHAM (J. D.). **Le plan de campagne contre la lèpre aux Indes.**—*Bull. Office Internat. d'Hyg. Publique.* 1925. June. Vol. 17. No. 6. pp. 627–628.

This note quotes from the appeal issued by the Viceroy of India in January last on behalf of the British Empire Leprosy Relief Association, the objects being to encourage the study of the causation and treatment of the disease, to establish clinics for early treatment and isolation refuges for the advanced crippled cases. At the end of March 4½ lakhs (£30,000) had been received. [The total now amounts to 18 lakhs.]

L. R.

READ (B. E.). **The Nature of the Leucocytosis induced in the Rabbit by the Administration of Chaulmoogra Oil and its Derivatives.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 605–612. [9 refs.]

The action of chaulmoogra oil has for long been explained by some workers as depending on a marked " leucocytic action." Experimental work on rabbits showed that treatment with chaulmoogra oil or ethyl-hydnocarpate administered by various methods produces little effect on the red corpuscles in small doses, but in very large ones some haemolysis and reduction of the red corpuscles occurs. Of greater importance are the leucocyte changes; toxic doses produced diminution of the leucocytes, but therapeutic ones caused an increase of about 100 per cent. which remained to a considerable extent

at the end of a month ; control experiments with the ethyl esters of the fatty acids of soy bean and other oils did not show any such effect. Differential counts show that the most striking change is an increase of the monocytes from about 1 per cent. up to as much as 6 per cent., while there was an apparent decrease in the basophiles. Further, blood withdrawn from the right side of the heart revealed showers of macrophages, retained in the pulmonary circulation, which after an intravenous injection of pure oil might form 80 to 90 per cent. of the total white count and persist for 18 hours, and microscopical examination after large toxic doses showed that the liver had been stripped of its endothelial cells. He concludes that " the leucocytosis induced by chaulmoogra oil is a means whereby the drug is brought into direct contact with the bacilli in the lymph circulation."

L. R.

KERR (Isabel). **The Chaulmoogra Treatment of Leprosy at the Hospital for Lepers, Dichpalli, Hyderabad State.**—*Lancet.* 1925. Aug. 22. pp. 373–375. With 3 text-figs.

This paper gives the results of 4½ years careful trial under favourable hospital conditions of recent preparations of chaulmoogra and hydnocarpus oils in association with E. MUIR, charts and records of the cases being kept. MUIR's E.C.C.O. mixture of ethyl esters of *Hydnocarpus wightiana* with creosote, camphor and olive oil were mainly used ; control trials of creosote and olive oil produced little effect, and later the pure esters, with creosote or iodine as an antiseptic, were used, and pushed up to even 16 cc. weekly. In some, in addition, a vaccine of Kedrowsky bacillus vaccine was used to increase the frequency of the reactions, the aim being to keep the patients on the point of reacting ; reactions of 48 hours were capable of bringing about a great deal of improvement, and the author always found that minimum doses of 0·25 cc. bring down the temperature. Complicating syphilis, malaria, etc., must be treated as well. MUIR's more recent method of infiltrating the esters combined with creosote 4 per cent. beneath the skin lesions, has given the quickest results, and causes no inconvenience beyond temporary burning sensation, so the patients prefer it to the intramuscular injections ; a 1 in 4 solution of trichloracetic acid also is painted over the lesions, both given weekly. Early cases show improvement in a few weeks, but older ones naturally require much longer. By infiltration as much as 20 cc., or even more, can be given weekly. Esters of linseed and olive oil gave less marked improvement. The results in 180 cases treated in 1923–24 were as follows : " 17 per cent. became symptom free, 45 per cent. very much improved, most of them likely to become symptom free ; 35 per cent. improved ; 3 per cent. worse or dead. Of infective cases 63 per cent. have become non-infective."

L. R.

FOWLER (Henry). **A Review of and some Observations in the Modern Treatment of Leprosy in China.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 594–600.

The author gives a brief history of his use of chaulmoogra oil and its derivatives in China. He began over 25 years ago with trials of the crude oil orally, and again as the result of DYER's advocacy in

1906, but without success. Later he had another failure with HEISER'S intramuscular injections of the oil, which only produced some improvement in the general health of the lepers after 22 months careful trial, although J. WILSON at Kwangju, in Korea, is now reporting good results with injections of large doses of the Chinese *Hydnocarpus anthelmintica* oil. Next, ROGERS' sodium hydnocarpate and morrhuate were used, and are still in use in parts of China in spite of more potent remedies being now available; "reports as to curative results are somewhat conflicting, but on the whole positive in character." Recently the esters of Chaulmoogra and Hydnocarpus oils have been used, with undoubtedly the most successful results so far, in some 43 China stations from which reports have been received, although no statistical tables of the cures obtained can yet be given; the earlier the case and the younger the patient the better is the prognosis. Chronic cases improve to some extent and lose the former characteristic disagreeable odour of leper homes, while their general health improves. Moogrol and the triply distilled Pekin Union Medical College esters, plus a 20 per cent. solution of creosote in camphor oil, or 20 to 25 per cent. pure camphorated oil, have proved best in doses increased to the point of tolerance of the patient, which varies widely. Prolonged oral administration of the esters produces fatty degeneration as shown by B. E. READ. Tartrate of antimony has not been successful in China, and the ethyl ester chaulmoograte treatment holds the field, although it often fails in sub-acute and chronic cases and in some early ones. Finally, he thinks a combination of segregation and treatment is necessary, but very difficult to carry out in present Chinese conditions.

L. R.

VURPILLAT (F. J.). **The Use of Extractives of Chaulmoogra and Cod-Liver Oils in Leprosy and Tuberculosis.**—*U.S. Nav. Med. Bull.* 1925. May. Vol. 22. No. 5. pp. 587–594. [20 refs.]

The author gives a good epitome of the published work from that of ROGERS in 1916 to date, and remarks that the available literature is remarkably small considering the importance of the therapy of acid-fast organisms. He believes further experimental and clinical trial of these substances is warranted in tuberculosis, with which he chiefly deals.

L. R.

AOKI (Taiyu), KAWAMURA (Kasayuki), KAMIKAWA (Yutaka) & FUKAMACHI (Roan). [**On the Intravenous Injection of Derivatives of Chaulmoogra Oil against Leprosy. III.**]—*Hifuka Hitsunyokika Zasshi* (*Jl. Dermat. & Urol.*). 1924. Apr. Vol. 24. No. 4. [Summarized in *Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. p. 108.]

This report deals with only 45 cases treated with four different preparations with improvement in 11. No details of the stage of the disease are given.

L. R.

MALCOMSON (J. E.). **Leprosy.**—*U.S. Nav. Med. Bull.* 1925. May. Vol. 22. No. 5. pp. 594–598.

Two years' treatment of 68 cases in the Virgin Islands is reviewed, 26 patients who refused treatment serving as controls. Careful

records showed that 20 treated anaesthetic men showed an average reduction of anaesthesia from 28 to 16 per cent., while 13 controls showed increases from 64 to 71 per cent., and similar results were obtained in the women. Further, of 15 treated nodular cases 13 have improved, while of 11 controls none improved and 7 are worse. Improvement in ulcers was not so marked, except in the important respect that the lepra bacilli disappeared from all the positive cases under the treatment, and in the younger and earlier cases the organisms also disappeared from the nasal secretion, but not in advanced chronic cases.

L. R.

O'Brien (Henry R.) & Runchaiyon (Boon Mahk). **Treatment of Leprosy in Bangkok with Ethyl Esters from** *Hydnocarpus Anthelmintica.*—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 600–605.

The authors report on the use of ethyl esters made from the seed of *Hydnocarpus anthelmintica* at Bangkok, Siam, where the trees are present in large numbers. The lepers in Siam are estimated at not less than 15,000, and two years' trial of the locally prepared drug is now recorded. The esters are made by heating the crude oil with alcohol and sulphuric acid about 15 hours, washing with water, caustic soda and water again successively until neutral, drying and distilling under 10 mm. reduced pressure, filtering and sterilizing. A leper hospital with 140 beds was opened, and here and in the out-patient clinic over 1,600 cases have now been treated, beginning with 0·5 cc., and increasing by 0·25 cc. per week to as much as the patient would tolerate, and a maximum of 4 cc. Some instead took from 1 to 5 cc. daily by the mouth owing to pain on injection. Slight febrile reactions were regarded favourably. On re-examining 357 cases in July and August, 1924, very similar results were found in cases both under and over three years' duration: namely, 0·7 and 0·5 per cent. much worse; 4·3 and 6·8 per cent. worse; 24·6 and 21·0 unchanged; 48·6 and 48·4 improved, and 21·7 and 23·3 much improved. No complete cures can yet be reported, although the combined figures show 71·1 per cent. improved, and in 22·7 per cent. improvement was quite marked. As might be expected, the hospital cases showed more progress than the out-patients. The Government laboratory hopes soon to be able to supply the esters to other countries.

L. R.

Read (B. E.) & Feng (C. T.). **Notes on the Preparation and Use of the Ethyl Esters from "the Chaulmoogra Oils."**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 612–618. [10 refs.]

The Pekin Union Medical College has been making these preparations for some years, and advise the following method:—

"2,500 grams of the crude fatty acids prepared by Dean's method are mixed with 2,500 cc. of 95 per cent. alcohol in a 6 litre flask, 50 cc. of strong sulphuric acid are added, and the mixture heated on a hot plate under a reflux condenser for from 8 to 10 hours. When esterification is considered complete the contents of the flask are poured into warm water, separated and washed with dilute caustic soda to remove excess of mineral acid and any uncombined fatty acids.

"The crude esters are distilled *in vacuo* at 2 mm. pressure. The first runnings are placed aside and added to a mixture of material in a waste jar which is later worked over again. The water white distilled esters are poured into two or three litres of 0·05 N sodium hydrate solution. After gentle rotation the mixture is allowed to stand for several hours when it separates into two clear fractions. This is repeated until an excess of alkali has been used, as shown by indicators. The washed esters are separated and dried and stocked in litre bottles which are placed in a refrigerator for 48 hours. At the end of this time they are carefully examined to see if any solid material has separated out. The presence of free fatty acids on cooling will show a decided sediment which can be filtered off and the specimens treated and re-distilled and re-washed. The resulting product is guaranteed to be free from irritating acids whether they be inorganic or organic."

Fractionation to obtain the hydnocarpic acid fraction has also been carried out, the fraction boiling around 215° being practically pure ethyl hydnocarpate and representing about 12 per cent. of the original mixed ethyl esters; the major part of the hydnocarpus fraction was obtained at a temperature of 184° to 190° at a reduced pressure of 2 mm. The method of preparation described above enables the pain-producing free fatty acids to be removed. Camphor, which is regarded by FOWLER as useful in lessening the pain, is soluble in esters up to 33·7 per cent., while 4 per cent. creosote is preferred by MUIR.

L. R.

i. READ (Bernard E.). **The Oral Administration of Chaulmoogra Oil in the Treatment of Leprosy.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 619–623. [1 ref.]

ii. ——. **Bibliography of Chaulmoogra Oil.**—*Ibid.* pp. 623–631.

i. The methods of O. E. A. TRAVERS and others of giving chaulmoogra oil orally are reviewed, and stress is laid on the necessity of obtaining fresh oils free from any rancidity, that of *Taraktogenus kurzii* being especially liable to undergo this change and to upset the stomach. It is also advised not to attempt to give very large doses orally, but about 6 drops once daily or even less frequently if progress is obtained, while magnesium salts, as a laxative, and calcium salts appear to be indicated as adjuvants to chaulmoogra oil or its esters.

ii. A valuable bibliography of 157 papers with an index to the authors' names.

L. R.

MUIR (E.). **Some Points of Importance in dealing with the Leprosy Problem.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 575–584. With 1 chart & 2 figs. on 1 plate.

In addition to narrating previously published work this paper brings forward a modification of the new treatments, which may prove of great practical importance. He had previously shown that the undistilled esters of fresh *Hydnocarpus wightiana* oil are less painful and more readily absorbed than distilled ones. Further investigation has shown that when the oil is cold-drawn from the fresh seeds of this common South Indian tree it is still clear and transparent, and even less painful than the esters. It is borne in larger doses, even up to 24 cc., is more readily absorbed, especially when given by MUIR's

infiltration method into the subcutaneous tissues beneath the skin lesions, and, as far as the present trials go, it seems to be not inferior, and it may prove considerably superior. The dose has been worked up to 20 cc. and over in some cases. [Its cost is less then one-tenth of that of the corresponding esters, and it can be obtained in any quantity from Smith, Stanistreet & Co., of Calcutta.]

L. R.

PALMER (F. J.). **The Treatment of Leprosy by Metallic Salts.**—*Proc. Assam Branch British Med. Assoc. Ann. Meeting. Jorhat. 2nd Mar., 1925.* pp. 10–21.

The author tried copper salts in leprosy without knowing that they had been used in Japan and Italy for a number of years. 1½ grains of copper citrate and 2 grains of tartrate of bismuth, injected intravenously, was often followed by severe and sometimes prolonged febrile reactions (such as the most experienced workers now regard as harmful in leprosy), the patients becoming worse for a time, but improvement followed, as often occurs for a time after reactions, although no case had cleared up at the time of writing. Notes are given of three cases treated by both drugs, and illustrating the reactions, which included the breaking out of fresh ulcers, yet he is " with increasing confidence looking forward, not to arrested diseases, but to complete elimination of the leprosy bacillus."

L. R.

MUIR (E.). **Leprosy—Diagnosis, Treatment and Prevention.**—*Trans. S. Indian Branch Brit. Med. Assoc.* 1925. Vol. 17. No. 3. pp. 105–124.

——. **The Present Position of the Treatment of Leprosy.**—*Jl. Roy. San. Inst.* 1925. Sept. Vol. 46. No. 4. pp. 131–134.

These papers summarize the author's well-known work, which has already been dealt with in connexion with earlier papers.

L. R.

HEISER (Victor G.). **The Present Status of Treatment for Leprosy.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 591–594.

This eminent leprologist considers the reports on the use of chaulmoogra esters to be very favourable, especially in the extensive trials in many hundreds of cases in Hawaii and the Philippines, which eliminates the factor of chance in small series; 23·5 per cent. of 327 admissions to the Honolulu Hospital have been paroled as negative in three years, and of the remaining cases 60 per cent. were improved, and in 31 per cent. the disease was arrested, leaving only 8 per cent. uninfluenced by the treatment. He mentions that at the United States Carville leper hospital DENNEY and HOPKINS are now obtaining still more remarkable results, not yet published, by weekly intravenous injections of 2½ milligrams per kilo body-weight of mercurochrome in a 1 per cent. watery solution. Antimony has not met the expectations aroused by the first South African reports. Much research work is now being done in five or six countries, and " when it is considered that only a few years ago a recovered case of leprosy was almost

unknown, while now such cases can be counted by the hundreds, there is much reason for optimism. A great improvement in the whole leprosy situation could undoubtedly be brought about if the many thousands of lepers now at large were treated to the point of becoming closed cases."

L. R.

Rodrieguez Arjona (Vicente). **Zur Antileprolbehandlung der Lepra.** [The Antileprol Treatment of Leprosy.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. July 1. Vol. 29. No. 7. pp. 334–339.

The author describes in detail a course of treatment with Antileprol lasting ten months, administered to eleven patients in a very advanced stage of leprosy. All were without doubt improved; not a single case of exacerbation or death occurred. The oral, intramuscular and intravenous methods were tried, the last-named upon only two patients, as the other nine refused to submit to it. The author, however, prefers the intravenous method of application, and recommends a dose (for his climate, *i.e.*, Yucatan) of 1·5 cc. twice a week.

L. R.

Aberastury (Maximiliano). **Proyecto de Ley Nacional sobre tratamiento de la lepra.** [Proposed National Law for Dealing with Leprosy.]—*An. del Depart. Nac. Hig.* Buenos Aires. 1923. Mar.–Dec. Vol. 29. No. 2. pp. 68–88.

The numbers of lepers in the Argentine has been increasing for many years. In the Muñiz Hospital in Buenos Aires in 1906 there were 29 cases; now there are 125, of whom 76 are Argentinos and 49 foreigners. The question of dealing with them is a complicated one, and a comprehensive series of proposals has been drawn up; these are cited in detail. The first section is concerned with compulsory notification of cases; doctors, the parents of an infected child, heads of firms, officials of the Army and Navy, proprietors of hotels, and so forth, are all to be bound to notify any case coming under their observation. Next are rules for the strict examination of all suspects and the reference of all doubtful cases to a Board. Thirdly, measures are proposed for treating all lepers in asylums, sanatoria, or colonies, and also those isolated at home, and all those who, though infected, are not regarded as dangerous. To avoid any misunderstanding these classes are defined: thus, the non-dangerous are those who have "no lesions capable of transmitting the disease by contact, who harbour no bacilli in the nasal, buccal or pharyngeal secretions," and have been declared after strict examination to be innocuous. Those treated at home must carry out proper disinfection and prophylactic measures and are prohibited from the exercise of any profession or performance of any work which directly or indirectly may cause spread of the disease by contagion. Next follow regulations, on the usual lines, for the management of leper colonies and for dealing with married persons one of whom is infected, and also with the children of such. The last section gives the disciplinary measures for infringement of these laws.

H. Harold Scott.

GALLI-VALERIO (G.). **Untersuchungen ueber Lepra.** [Investigations on Leprosy.]—*Virchow's Arch. f. Path. Anat. u. Physiol.* 1925. Feb. 24. Vol. 254. No. 3. pp. 765–770. With 3 text figs. [12 refs.]

Having the opportunity of studying the disease among the lepers of the Canton of Wallis in Switzerland, the author carried out a number of experiments. For streak preparations he used Ziehl's hot fuchsin stain, decolorizing with a ⅓ aqueous solution of Ac. nitricum, and counter- staining with thymol blue (piana blue). For sections he preferred Fränkel-Gabbet's method. Lepra bacilli were found in all lesions, in the nose, often in the skin, and in one case in the faeces.

Two white rats were inoculated in the brain. One died after 2 days, the other after 4 months. Lepra bacilli were recovered in both cases from the brain, but from no other organs. [These were probably dead bacilli.]

On examining the contents of lepromata after treatment with ROGERS's gynocardates and MCDONALD & DEAN'S ethyl esters, the following changes in the lepra bacilli were found :—

Although some bacilli were still in a good state of preservation, the majority were in more or less far-advanced state of lysis. Some still kept their normal form, but were stained only in part and showed chains of granules, and some conglomerations were entirely transformed into a mass of fine granules. The same changes were found in the nasal secretion.

The author then examined several times over a period of months some ethyl-ester of chaulmoogra oil containing lepra bacilli. Although lysis of some bacteria occurred, the great majority remained quite normal. He concludes that, although these substances have an inhibitory effect upon the development of the bacilli, this effect is only manifested where the ethyl ester comes into immediate contact with the bacilli. This, however, cannot explain the great lysis of lepra bacilli which occurs in the lepromata with relatively small doses of ethyl esters. He, therefore, concludes that the decomposition products of chaulmoogra-oil act upon the organism itself, promoting the production of lipases, which attack the outer shell of the Hansen bacterium, and cause its lysis. [This was previously suggested by ROGERS.] It is also very probable that the products of the lysis, when they are absorbed, in their turn act upon the organism and promote the formation of antibodies, which contribute to the cure.

L. R.

ROSENTUL (M.) & KRUGLAK (E.). **Zur Frage der bakterioskopischen Diagnose der Lepra.** [The Bacteriological Diagnosis of Leprosy.]—*Deut. Med. Woch.* 1925. May 22. Vol. 51. No. 21. pp. 866–867. [6 refs.]

The authors strongly recommend the method of GRENBAUM and SCHAMBERG for the diagnosis of leprosy, and describe two cases in which it was successful in the early recognition of the disease.

They also tested Prof. W. W. IWANOW'S view of the value of puncturing the inguinal gland. Their technique is described in detail, and their results are summarized as follows :—

64 cases were examined, 26 of lepra tuberosa, 16 of lepra mixta, 22 of lepra maculo-anaesthetica.

Positive results in nodular and mixed cases, 100 per cent.

Positive results in maculo-anaesthetic cases, 95 per cent.

One negative result only in a patient previously treated by Hamzan's thymol method.

Previous treatment with nastin, chaulmoogra oil, thymol, and turpentine oil, in 28 cases had no influence on the result of the bacteriological examination.

The finding of globi in the gland puncture fluid supports, in the authors' opinion, the theory of IWANOW and others against that of UNNA, *viz.*, that the globi represent a conglomeration of bacilli which possibly originate by agglutination.

L. R.

KONDO (Seigo). **Der Verwendungsstoffwechsel der sogenannten Leprabacillen.** [The Katabolic Activity of the So-called Lepra Bacilli.] —*Ztschr. f. Hyg. u. Infektionskr.* 1925. June 6. Vol. 104. No. 4. pp. 714–728. [32 refs.]

Metabolism experiments were tried with 13 strains of acid-fast bacteria that had been cultivated from leprous material, from which there emerges the fact that very considerable differences exist between the behaviour of the individual strains. While on the one hand the acid-fast bacillus of ROST and WILLIAMS (L3) cultivated from leprosy possesses about the same metabolic activity as, *e.g.*, the acid-fast saprophytic bacteria, the Nabarro-Bayon strain (L11) on the other hand is in this respect related to the tubercle bacilli of warm-blooded animals which are characterized by a small katabolic activity (especially in their behaviour with sodium citrate, glycerin, mannite, acetate, grape-sugar and sodium asparaginate). The remaining strains cultivated from leprous material group themselves between these two extremes and in their conditions of growth partly resemble the tubercle bacilli of cold-blooded animals. This latter fact, that no sharp limits, but only gradual transitions, exist between the two extremes, strengthens the possibility that we have here, in spite of the differences of their metabolic activity, only varieties of a single bacterial species, especially when we take into account the fact that all the strains come from leprous material and therefore from an identical medium. In face of this it is impossible, on the basis of metabolic experiments, to separate the acid-fast strains cultivated from cases of leprosy from other acid-fast bacteria.

L. R.

KONDO (Seigo) & NODAKE (Rishichi). **Ueber die Bedeutung der Wasserstoffionenkonzentration für die Entwicklung der sogenannten Leprabacillen auf künstlichen Nährböden.** [The Significance of the Hydrogen Ion Concentration for the Development of So-called Lepra Bacilli upon Artificial Culture Media.]—*Ztschr. f. Hyg. u. Infektionskr.* 1925. Aug. 19. Vol. 105. No. 1. pp. 67–73. [5 refs.]

1. By cultivation upon nutrient solutions of various reactions, the limits of growth were found for a number of acid-fast bacteria,

which had been obtained from leprous material. It was found that all strains, in contrast to the genuine tubercle bacilli of warm-blooded animals, show a very considerable extent of growth that approaches fairly closely that of saprophytic acid-fast bacilli. On the acid side the limit of growth of all lepra strains lies at pH 5·7, while on the alkaline side considerable differences were demonstrated between the individual strains. It is noteworthy that the extent of growth of the strains on synthetic culture media is slighter than on glycerin broth.

2. The changes of reaction occurring in an originally neutral (pH 7·1) fluid under the influence of the development of these micro-organisms allow in general 3 types to be distinguished, but the cultures of one and the same strain often do not show a uniform behaviour. The results of the comparative experiments made with glycerin broth and two synthetic solutions point to the dependence of this change of reaction upon the composition of the nutrient medium.

L. R.

Chuma (M.). & Gujo (K.). **Eine histologische Untersuchung ueber das Leprom mittels Vitalfärbung.** [A Histological Investigation of Leproma by means of Vital Staining.]—*Virchows. Arch. f. Path. Anat. u. Physiol.* 1923. Vol. 240. No. 3. pp. 469–482. With 3 text figs. [20 refs.]

The authors found that they were unable (on one occasion) to stain leprosy nodules by the direct injection of toluidin blue, and had difficulty in vital staining by soda carmine. Indian ink, however, diffused well into the nodules. They find lepromata of the skin to be largely composed of cells capable of storing up dyes or carbon particles in granular form ; in parts of the nodules where dye is not present poor permeation may be supposed. The granulation cells in which the dye collects are chiefly epitheloid cells and Virchow's leprosy cells. It is these cells which contain the lepra bacilli, which may be found side by side with dye granules. The connective tissue cells also store up these substances and are phagocytic. The authors therefore assume that the leprous epithelioid cells are histioid. The leprous infiltration, according to most investigators, has its origin preferably in the neighbourhood of vessels, sweat glands and sebaceous glands, where histioid cells are present in large quantity and in a resting condition. They believe that the histioid cells play an essential part in the formation of the leprous infiltration.

L. R.

Simon (Louis). **Lèpre et réaction de Wassermann.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 378–379.

The author has continued the work of Mathis and Bonjean, who found 40 out of 41 leprosy cases had negative Wassermann reactions, and he reports on 24 cases. He obtained positive results in 23 (15 strongly so), and the remaining one doubtful by the method of Calmette, Massol and Hecht. He thinks, therefore, that the Wassermann reaction is positive in leprosy.

L. R.

Frazier (Chester N.) & Wu (Hsien). **Blood Serum Globulin in Leprosy.**—*Amer. Jl. Trop. Med.* 1925. July. Vol. 5. No. 4. pp. 297–306. [9 refs.]

Of 32 cases of leprosy 17 showed excess of serum globulin by the precipitation test of degrees varying from 1 to 3 plus. The percentage of globulin was estimated; the nodular cases averaged 4·68 per cent., the mixed cases 4·52 per cent., the active maculo-anaesthetic cases 4·23, and the latent ones 3·11 per cent. Apparently the serum globulin in long-standing cases with clinically latent infection decreases to within the normal range, so the reaction will be worth studying in relation to the effects of treatment.

L. R.

MacCormac (Henry). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* (Section of Dermat.). 1925. Sept. Vol. 18. No. 11. p. 61.

Pupo (Joao de Aguiar). **Estado actual da therapeutica da lepra.**—*Ann. Paulist. Med. e Cirurg.* 1925. Jan.–June. Year 13. Vol. 16. No. 1–6. pp. 1–16. [49 refs.]

Richmond (P.). **Leprosy at the United States Naval Hospital, Great Lakes, Illinois—Report of a Case.**—*U.S. Nav. Med. Bull.* 1925. July. Vol. 23. No. 1. pp. 25–28.

HELMINTHIASIS.

Joyeux (Ch.). **L'épidémiologie et la prophylaxie des helminthiases.**—*Bull. Acad. Méd.* 1925. Apr. 14. Year 89. 3rd Ser. Vol. 93. No. 15. pp. 405–408.

The study of the zoology and biology of helminths has provided the medical pathologists with a large number of interesting data bearing upon the epidemiology and prophylaxis of worm maladies. The author notes some of the more recent discoveries, dealing particularly with the "specificity of hosts and its medical consequences," which he illustrates by reference to *Ascaris lumbricoides* and *A. suis*, *Fasciolopsis buski*, *Hymenolepis nana* and *H. fraterna*. The peculiar geographical distribution of *Hymenolepis nana* in man is said to depend upon factors yet unknown, although the life cycle of the parasite has been elucidated.

R. T. Leiper.

Joyeux (Ch.). **Epidémiologie, prophylaxie et thérapeutique des helminthiases d'après les travaux récents.**—Reprinted from *Biol. Méd.* 1924. Vol. 14. No. 5. 31 pp. With 11 text figs. [9 refs.]

This excellent résumé of recent work in Helminthology does not lend itself to abstraction. It discusses the information collected during the past decade in life-histories and prophylaxis and the more recent discoveries in helminthic therapeutics. It concludes with a review of the workers and publications in helminthology outside of France and regrets that so little has been done in that country.

T. W. M. Cameron.

Joyeux (Ch.). **Les migrations des helminthes dans l'organisme humain.**—*Jl. Méd. Français.* 1924. Sept. Vol. 13. No. 9. pp. 355–361. With 2 figs.

Joyeux gives a general outline of the principal helminthic infections of man. He groups them into those penetrating the skin or having a blood-sucking insect as intermediate host, and those entering by the mouth. Abnormal migrations may occur, and he cites the development of *Cysticercus cellulosae*, *Coenurus cerebralis* and Sparganum in various positions, *Fasciola hepatica* under the skin and in the lungs, Paragonimus in the brain, Ascaris in various localities, and Oxyuris in the sub-mucosa, peritoneal cavity and female genitalia.

T. W. M. C.

Joyeux (Ch.). **L'épidémiologie des helminthiases.**—*Jl. Méd. Français.* 1924. Sept. Vol. 13. No. 9. pp. 366–371. With 4 figs.

This paper deals briefly with the diagnosis of helminthic infections by means of ova or adults in the stool, sputum, urine or blood, or by serological examination ; and with general measures of prophylaxis.

T. W. M. C.

RAILLIET (A.). **Les helminthes des animaux domestiques et de l'homme en Indochine. (1re Partie).**—*Bull. Soc. Zool. de France.* 1925. Apr. 10. Vol. 49. No. 8–10. pp. 589–608.

This is the first part of a summary of an extensive but not published work, which is available for reference at the Laboratory of Parasitology at Alfort, France. The summary consists of an annotated list of the Flat-worms of man and the domestic animals in Indochina. Several new species—none of them human—are described. The human parasites from this region referred to in Railliet's article are as follows :—

Fasciola hepatica.
Fasciolopsis buski.
Opisthorchis felineus and *O. viverrina.*
Clonorchis sinensis.
Euparyphium malayanum.
Paragonimus westermani.
Schistosoma japonicum.
Gastrodiscoides hominis.
Dibothriocephalus latus and *Sparganum mansoni.*
Taenia solium, Taenia saginata and Hydatid.
Raillietina madagascariensis.
Hymenolepis nana.

T. W. M. C.

WYCKOFF (Harry A.) & FRENCH (William O.). **Intestinal Parasites among Filipino Food Handlers.**—*Jl. Amer. Med. Assoc.* 1925. Apr. 4. Vol. 84. No. 14. pp. 1029–1030.

Since many of the Filipinos who come to the United States obtain employment in kitchens and as waiters, the authors examined 34 such, and found that 28 of them harboured intestinal parasites of one form or another—hookworm in 21, Trichuris in 16, amoeba cysts in 10 [the nature of Amoeba is not stated]. All those with hookworm were given 10 cc. of carbon tetrachloride ; two months later 14 of these were re-examined and no ova were found in any.

H. Harold Scott.

YASUTAKE (Teruichi). **Statistische Studien ueber intestinale Parasiten in der Gegend von Okayama.**—*Okayama-Igakkai-Zasshi* (*Zentral. d. Okayama med. Gesellshaft*). 1925. July. No. 426. German summary p. 748. [In Japanese.]

Contrary to the findings recorded by previous investigators the author, from examinations carried out between 1917 and 1922, found Ascaris to be the most frequently present helminthic parasite ; next to this the Trichuris, and to a considerably less degree *Ancylostoma duodenale* and *Distomum spathulatum.* Ascaris, Trichuris and Oxyuris were more common in women, Ancylostoma and Distomum in men. Tapeworms were rare but more often seen in men than women. Negative cases are increasing in numbers year by year as a result of measures now taken in hand.

H. H. S.

SIMON. **Parasites intestinaux du Cambodge.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 61–64.

The commonest human parasite in this area is Ascaris, occurring in 88 per cent. of cases. Hookworm (apparently *Necator americanus*) is found in 22 per cent. of the population, but Strongyloides and whipworms are relatively rare. *Ascaris canis* was found on two occasions in man, and *Taenia saginata* in 5 out of 335 cases examined.

T. W. M. C.

HALL (Maurice C.) & CRAM (Eloise B.). **Some Laboratory Methods for Parasitological Investigations.**—*Jl. Agric. Res.* Washington. 1925. Apr. 15. Vol. 30. No. 8. pp. 773–776. With 1 text fig. [5 refs.]

The writers suggest the use of a nest of sieves, such as that described by the senior author in 1917, as an indispensable part of the equipment of a Parasitological Laboratory for examining faeces and intestinal contents for helminths and their eggs.

T. W. M. C.

REMLINGER (P.). [**Chylurie, Éléphantiasis et Filariose au Maroc.**]—*Maroc. Méd.* 1924. Apr. 15. pp. 109–11. [Summarized in *Bull. Inst. Pasteur.* 1925. Feb. 15. Vol. 23. No. 3. p. 144.]

Although chyluria and elephantiasis are not uncommon in Morocco, Bilharzia or Filaria in man has not been found. Chyluria is sometimes due to the opening of Hydatid cysts into the urinary tract.

T. W. M. C.

IWAHASHI (Uyematsu). [**Relation between the Bird and the Eggs of the Parasites.**]—*Iji Shimbun* (*Med. News*). 1925. Apr. No. 1161. [Summarized in *Japan Med. World.* 1925. June 15. Vol. 5. No. 6. p. 156.]

By feeding birds (kind not stated) with faeces containing eggs of parasites it was ascertained that the eggs passed in 2 to 9 hours, the maximal elimination occurring in 3 hours. The author believes that he has observed the domestic goose to pass ascaris eggs (in 9·6 per cent.) and oxyuris eggs (in 33·3 per cent.) which had been derived from natural infection.

R. T. L.

SPENCE (B. H. H.). **The Eradication of Helminthiasis from the Egyptian Army.**—*Jl. Roy. Army Med. Corps.* 1925. May. Vol. 44. No. 5. pp. 321–342. With 8 text figs.

This paper, though containing nothing original as regards the eradication of the two forms of helminthiasis dealt with, gives some interesting statistics relative to the prevalence of ankylostomiasis and schistosomiasis in the Egyptian Army. The lack of resistance of the Egyptian recruit and soldier to the hardships incidental to training and service is not due, as some have believed, to "inherent defect," but to helminthic infection.

The author examined 292 recruits and found 91 per cent. harbouring worms of some sort; 73 per cent. with hookworms, and 52 per cent. with schistosomes. The former were treated with 5 cc. of carbon tetrachloride followed two hours later by 25 gm. of magnesium sulphate in 50 cc. water. In spite of the dose being larger than that usually given few showed any untoward effects, and, when re-examined 3 months later, 75 per cent. were found to be still free. Thymol and oil of chenopodium gave less satisfactory results.

Schistomiasis cases were treated with antimony sodium tartrate injected thrice weekly, starting with 0·5 grains and increasing to a maximum of 2 grs., a total of 21 gr. being given in four weeks. 95 per cent. of the cases of *S. haematobium* infection appeared to be cured, no ova being found three months later. Probably, had the full course recommended by CHRISTOPHERSON been administered, the remaining

5 per cent. would also have been cured. A very small proportion of the patients harboured *S. mansoni*: 0·3 per cent. of 1,264 recruits, and 1 per cent. of 2,352 soldiers serving in Cairo.

H. H. S.

WELLS (Herbert S.). **A Quantitative Study of the Absorption and Excretion of the Anthelmintic Dose of Carbon Tetrachloride.**—*Jl. Pharm. & Experim. Therap.* 1925. Apr. Vol. 25. No. 3. pp. 235–273. With 5 text figs. [27 refs.]

This article details the results of some ingenious experiments devised to estimate quantitatively the absorption of carbon tetrachloride from the dog's intestine, when given in the therapeutic dose of 3 cc., and also the excretion of the drug by various routes, in particular the respiratory. Chemical minutiae are dwelt upon at some length. Briefly, the tissues to be analysed for the drug were cut up under 97 per cent. alcohol in the distilling flask and the condensed vapours were received into alcohol. It was found that there was almost constantly a loss of 7–10 per cent. during the distillation.

The intestine of the experimental animal is tied tightly at the end of the colon and also the duodenum at the tip of the pancreas; the drug is then injected into the duodenum, the needle of the syringe being embraced by the ligature. The dogs were killed at periods varying from one to twenty-seven hours afterwards. The absorption rate was found to be remarkably regular over the whole period. It was found that 50 per cent. alcohol did not alter the rate, but when the carbon tetrachloride was injected in solution in 95 per cent. alcohol absorption was increased considerably, even though water might be subsequently added to reduce the concentration of the alcohol to 50 per cent.

The author rightly stresses the point that these animal experiments must not be taken as applying equally to man. With magnesium sulphate the rate of absorption was little, if at all, altered.

To solve the question of excretion analyses were made of the blood, urine, bile and expired air. As the drug has to pass through the liver and lungs before reaching the systemic circulation much is dissipated, and the blood analyses are, therefore, not of much service. Very little appears to be excreted in the urine and none was found in the bile.

Excretion was demonstrated to take place completely and rapidly after absorption by the expired air. The author experimented upon himself, taking the drug first by mouth and later by a duodenal tube, and found that, whereas in dogs absorption appeared to proceed at an almost uniform rate, in man there was a rapid absorption at first, and then a marked fall in the rate.

When given, as at present, in a fixed dose of 3 cc. by mouth, especially when no dietetic regulation is carried out, the concentration and rate of entry into the duodenum is probably very variable. A smaller amount would, therefore, probably suffice if given by the duodenal tube, provided patients would submit to such a method. It was shown that in dogs even the dose of 3 cc., which is considered as perfectly safe, does considerably injure the liver. The author consequently advises the tube method of administration for special cases, such as alcoholics and small children, in whom considerations of safety would outweigh ease of administration.

H. H. S.

HALL (Maurice C.) & CRAM (Eloise B.). **Carbon Trichloride as an Anthelmintic, and the Relation of its Solubility to Anthelmintic Efficacy.**—*Jl. Agric. Res.* Washington. 1925. May 15. Vol. 30. No. 10. pp. 949–953. [11 refs.]

Experiments show that carbon trichloride has no anthelmintic value. Attention is drawn to the fact that the order of efficiency of the chlorine compounds of ethane and methane is as follows: CCl_4, $CHCl_3$, $C_2H_4Cl_2$, and CCl_3, and an attempt is made to relate this efficiency with their solubility. The authors consider that a chlorine compound with approximately the same chlorine content as carbon tetrachloride, but slightly less soluble, might be safer if not more effective.

T. W. M. C.

HALL (Maurice C.) & SHILLINGER (Jacob E.). **Tetrachlorethylene, a New Anthelmintic.**—*Amer. Jl. Trop. Med.* 1925. May. Vol. 5. No. 3. pp. 229–237.

Tetrachlorethylene appears to be as effective a drug as carbon tetrachloride against hookworms in dogs; it may even be slightly more effective. The factor of safety, pathogenicity, and contraindications appear to be about the same as for the older drug. The present cost of the drug is about three times that of carbon tetrachloride; but the writers suggest that the dose for man would not be over 3 cc., and might even be 2 cc.—a smaller dose han of carbon tetrachloride. It is suggested that a purge should be administered with tetrachlorethylene in order to reduce any transient bad effects. It has a pleasanter taste and odour, and it is suggested that it should be cautiously tested under hospital conditions in order to ascertain its value against human hookworm disease.

T. W. M. C.

MALCHI (A.). [**Two Cases of** *Schistosoma mansoni* **in Palestine.**]—*Harefuah.* (*Palestine Hebrew Med. Jl.*). 1924. June. Vol. 1. No. 2. pp. 75–79.

Although vesical bilharziasis is stated to be endemic in Palestine, it is the common opinion that the intestinal form does not occur there. The author gives a short account of two cases of intestinal bilharziasis due to *S. mansoni* identified in the course of microscopical examinations carried out in the Hadassah Laboratory at Tel-Aviv.

One case refused specific treatment, but a year later appeared again with the same symptoms. *S. mansoni* eggs were again found in the stools. She received treatment at the Workmen's Dispensary (Dr. M. COHEN), and the two last examinations of the stools proved negative. The second case began the treatment, but after 2-3 injections disappeared.

It is striking that both these cases came from Yemen (Arabia) where intestinal bilharzia is known. But even if the infection were not of Palestinian origin, the existence of such imported cases constitutes a focus for the spread of new infections of intestinal bilharziasis in Palestine.

R. T. L.

Cawston (F. G.). **British Indians and Bilharzia Disease.**—*Jl. Trop. Med. & Hyg.* 1925. May 15. Vol. 28. No. 10. pp. 193–195.

Attention is drawn to the fact that prior to the return of troops from Egypt, many of whom remained at Durban, *Schistosoma mansoni* was not known in South Africa except in native labourers imported from Portuguese East Africa for work in the Johannesburg mines. In 1916 the author pointed out that the intermediate hosts of *S. haematobium* and *S. mansoni* were breeding at Durban in large numbers, and that there was consequently a danger of the latter infection becoming endemic there. Further, since numbers of European children, natives and Indians bathe and fish in the pools, and since control of the disease is difficult in the last-named, it is suggested that the Indian Government should ask the Union Government to take steps for the protection of Indian schoolchildren in Natal against schistosome infection.

H. H. S.

Walker (J. H. C.). **Examination of a Field Company for Schistosomiasis.**—*Jl. Roy. Army Med. Corps.* 1925. May. Vol. 44. No. 5. pp. 382–384.

The accidental discovery of eosinophilia in the blood of a N.C.O. of the R.E. admitted to hospital at Ismailia on account of a slight febrile attack led to the examination of the excreta, and ova of *S. haematobium* were found. Further examination of 109 sappers, all of whom had been engaged in bridging operations on a canal containing Nile water, revealed five definite cases of infection. Others who showed pyuria or haematuria were detained for observation and repeated examinations were made for ova, whereby three others were detected. One in whom no ova were found at any time continued to pass blood in the urine, and he was, therefore, subjected to treatment, and his condition cleared up. A table is given of the differential leucocyte counts [apparently on one occasion only] of 10 cases.

H. H. S.

Peltier (M.). **La bilharziose au Togo.**—*Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 592–596. With 1 map in text.

The environs of Lake Togo, especially at the mouths of the rivers Haho and Sio, constitute a fruitful source of schistosome infection. The Sio, in particular, abounds in swamp lands in which *Bullinus contortus* thrives luxuriantly. Almost all the children from 8 to 10 years of age suffer from parasitic haematuria and the mortality from this and the anaemia resulting therefrom is very high. During the months July-December almost the entire population live by fishing, the men wading waist-deep in the water, itself kept constantly infected by the urine of the fishermen.

The Sio has, during the last decade, become much more sluggish near its outlet owing to the abundant growth of weeds. Prior to this time schistosomiasis was much less common, and the author suggests that removal of these weeds would not be a difficult or very expensive matter, and would procure inestimable benefit to the inhabitants by reducing, if not eradicating, schistosomiasis and incidentally removing the breeding-places of malarial mosquitoes.

H. H. S.

CULLEN (J. P.). **Asiatic Bilharzia Disease.** [Memoranda.]—*Brit. Med. Jl.* 1925. Apr. 11. p. 694. [2 refs.]

The author calls attention to the fact that during the past twelve months he has reported nine instances of infection by *Schistosoma japonicum* on the frontier of British India and China, and wonders whether this indicates the present westerly limit of the disease. Unless patients are subjected to vigorous treatment with antimony and the Oncomelania is attacked the dangers of further spread are considerable.

H. H. S.

PORTER (Annie). **Some Flukes bred from Cercariae recurring in Schistosoma-Transmitting Molluscs in South Africa.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.) 1925. June. Vol. 18. No. 8. pp. 56–57.

Many of the intermediate hosts of Schistosomes in South Africa harbour other cercariae, and 22 different species have been found in *Physopsis africana*, which is the chief intermediate host for *S. haematobium* and an occasional host of *S. mansoni*. The principal transmitter of *S. mansoni*, *Planorbis pfeifferi*, also harbours other cercariae, as does *Isodora tropica*. *S. haematobium* is transmitted by *Physopsis conicum*, and (rarely) by *Limnaea natalensis*, from both of which other cercariae have been recovered—many of them with unknown adults.

T. W. M. C.

BETTENCOURT (A.) & DA SILVA (E. Pereira). **The Cercaria of *Schistosoma haematobium*. With Reference to an Article of Blacklock and Thompson on Human Schistosomiasis in Sierra Leone.**—*Arquivos Inst. Bact. Camara Pestana.* 1925. Vol. 6. 21 pp. With 11 text figs. [23 refs.]

The authors disagree with BLACKLOCK and THOMPSON (this *Bulletin*, Vol. 21, p. 941) that it is impossible to separate the cercariae of the human schistosomes. They give a detailed description of the cercariae of *S. haematobium* as found in *Planorbis metijensis* in Tavira (South Portugal) and an illustrated key for the differentiation of the three human forms. The principal criterion of difference depends on the number and nature of the cephalic glands and to a lesser degree on the size.

	S. haematobium.	*S. mansoni.*	*S. japonicum.*
Number of cephalic glands	3 pairs.	5 pairs (Khalil) or 6 pairs (Faust).	5 pairs.
Nature of glands	acidophile.	2 pairs acidophil and 3 pairs (Khalil) or 4 pairs (Faust) basophile.	acidophile.

The authors are convinced that the cercariae studied by them are true *haematobium*, as they were invariably found uncontaminated

by other forms, and when mice were infected, adult males and females of *S. haematobium* were recovered.

T. W. M. C.

Cawston (F. G.). **The Identity of the Rarer Schistosomes of Man and their Intermediate Hosts.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 215–218. With 2 text figs.

Four distinct types of schistosome ova are found in the urine of schoolboys in Natal, but the life-histories of the different miracidia have not been worked out owing to ignorance of their respective intermediate hosts.

For differentiation of allied molluscan hosts the author suggests more detailed examination of the radulae, as in his previous papers.

H. H. S.

Suldey (E. W.). **Infection double mixte par** *Schistosomum mansoni* **et** *S. haematobium* **chez un dysentérique amibien.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. p. 458–460.

Urinary infection by *Schistosoma mansoni* and rectal by *S. haematobium* have been recorded, but the present case, a child of 10 years, is of special interest because, in addition to dysentery with the presence of *E. histolytica* in the stools, the stool and the urine contained ova of both schistosomes in the proportion of 15 *S. haematobium* to 2 *S. mansoni*. Emetine was given and the entamoebae disappeared, but this drug had no influence at all on the schistosomiasis. The patient left the hospital still harbouring these worms.

H. H. S.

Fairley (N. Hamilton). **Experimental Studies in Bilharzia Therapy** (*S. spindalis*). **A Preliminary Report.**—*Indian Med. Gaz.* 1924. Aug. Vol. 50. No. 8. pp. 377–381. [23 refs.]

Fairley finds that ova deposition by *Schistosoma spindalis* of the goat is greatest in the liver, but also occurs in the mucosa of the large and small intestine and in the gall bladder, mesenteric and portal-fissure glands, the lungs and pancreas. Dysentery is rarely present however. Ova are always immature when deposited and become mature in the viscera of the host and in untreated animals; not only is there a high proportion of undeveloped ova, but dead ova are also present in large numbers. 19 experimentally-infected goats were treated with 1 per cent. tartar emetic (the maximum dose being 4 cc. on alternate days), but with only partial success, only 5 animals being cured. Urea stibamine was not found to have any therapeutic action. Eight animals were infected with large numbers of cercaria and were afterwards treated with varying amounts of 1 per cent. solution of emetine hydrochloride. Three died from over dosage, but in the other five cases all the female worms were killed; in one case a solitary male was recovered alive. In this goat also some living ova were found, but in the other animals all the ova were dead, although they persisted in diminishing amounts for several months.

Fairley considers that emetine hydrochloride possesses a maximal efficiency in the treatment of this species, and gives much superior results to tartar emetic. He suggests that this may prove to be the case with human bilharziasis as well.

T. W. M. C.

CHRISTOPHERSON (J. B.). **The Cure of Schistosomiasis by the Intravenous Injection of Antimony Tartrate.**—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 108–111. [12 refs.]

Christopherson considers that FAIRLEY is unjustified in considering that because emetine proved superior to antimony tartrate against *Schistosoma spindalis* in goats, "it will be very surprising if the superiority of emetine hydrochloride does not hold for the human type of schistosomiasis as well." He points out that relapses in human Bilharzia disease are almost invariably due to insufficient dosage, and that where the treatment is sufficient failures do not occur. He endorses LEIPER'S view that the ova make their way through the tissues by means of a digestive fluid, and that if the secretive apparatus were paralysed, the ova would be unable to proceed, and would disappear from the faeces and urine. As only a small dose of antimony is required to destroy the ova, ova may be absent before the patient is really cured; and if they reappear, it is because sufficient antimony has not been given to destroy the adults as well.

He points out that in FAIRLEY'S own cases, emetine proved more toxic than antimony, and that this is true for man also, as has been demonstrated at Kasr-el-Ainy in 1923.

T. W. M. C.

LEE (C. U.). **The Treatment of Schistosomiasis japonica.**—*China Med. Jl.* 1925. Apr. Vol. 39. No. 4. pp. 321–331. [17 refs.]

A party of five Roumanian gypsies bathed in the water of the flooded banks of the Yangtse River. Five days later they all, with one exception, suffered from an itching, papular eruption, and four weeks later they had rise of temperature and diarrhoeic symptoms, and ova of *Schistosoma japonicum* were found in the stools. Details are given of two of the patients, one treated by antimony alone, the other first by emetine, later by antimony. The emetine was slower and less satisfactory in its action. The degree of eosinophilia was great—70 per cent. in one and 50 per cent. in the other before treatment, and even at the time of discharge as cured the figures were 27 and 36 per cent. In each there was a still further increase after the first injection of antimony.

H. H. S.

ANDERSON (Ch.) & BANCE (J. E.). **A propos de l'action de l'eau savonneuse sur le miracidium de** *Schistosomum haematobium.*—*C.R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 937–938. [3 refs.]

The effect of soap in water upon miracidia of *Schistosoma haematobium* has been differently reported by A. BETTENCOURT and Ch. Anderson. The authors ascribe this to difference of technique, the former employing ova, the latter miracidia. They, therefore, maintain that further experiments are needed and, moreover, that these should be carried out with definite numbers of miracidia, if reliable results are to be attained.

H. H. S.

Lefèvre (Raoul). **La bilharziose au Soudan français (cercle de Mopti).**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 720–722. [1 ref.]

The causal agent here is *S. haematobium* only, and of the 19 cases (17 male and 2 female) studied, 18 were vesicular and only one intestinal. The intermediate host for this area has not yet been discovered.

T. W. M. C.

Maekawa (Hitoshi). **On the Pathology of Mesenterium in Ascites. 2. Histological Investigation on the Mesenterium in Schistosomiasis Japonica.**—*Kyoto Igakkwai Zasshi* (*Jl. of Kyoto Med. Soc.*). 1924. Dec. Vol. 21. No. 12. [Summarized in *Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. pp. 107–108.]

Except for the presence of eggs of the parasite the general features of the mesentery in Japanese schistosomiasis agree with those of liver cirrhosis.

R. T. L.

Cawston (F. G.). *Gundlachia* **at Malvern, and an Examination of the Radulae of other Intermediate Hosts of the Trematode Parasitic Worms in Natal.**—Reprinted from *Trans. Roy. Soc. S. Africa.* Vol. 13. Pt. 1. pp. 39–42. With 9 figs. on 2 plates.

This paper is concerned, as the title shows, with various molluscan intermediate hosts of trematodes found in Natal, but in that it is devoted entirely to measurements of the snails, their teeth and radulae, the substance is possibly of interest to the malacologist rather than the helminthologist.

H. H. S.

Pang (Chen). **Fecal Examination of Kwangtung Students in Peking for** *Clonorchis sinensis.*—*Nat. Med. Jl. China.* 1925. Feb. Vol. 11. No. 1. pp. 41–45. With 1 map in text.

An outline map of the Kwangtung Province is marked to indicate the prevalence of Clonorchis infection. In 1923, the author examined 115 students entering the Peking National University, and found 43 of them infected (37·39 per cent.). The following year another 38 were examined and 17 found positive. The region most heavily infected endemically was Ch'aochowfu, and there appeared to be a fairly close correlation between the incidence of Clonorchis infection and the habitual consumption of raw fish.

H. H. S.

Faust (Ernest Carroll). **Some Recent Aspects of the Epidemiology of Clonorchis Infection in China.**—*China Med. Jl.* 1925. Apr. Vol. 39. No. 4. pp. 287–296. With 2 maps. [18 refs.]

As a result of extensive investigations as to the prevalence of *Clonorchis sinensis* the author found that infection was fairly common among the coolie classes in South China, infrequent in the Central Provinces, and unknown in North China in man, though dogs and cats were heavily infected in the Central Provinces, and on an average some 30 per cent. of these animals in N. China. In explanation of these peculiarities it was found that only in the south did man eat fish raw or insufficiently cooked, and furthermore, that in other parts of China the infected fish harboured the encysted larvae on the scales

and not at all, or only rarely, in the flesh. As regards the molluscan host *Bythinia striatula* is common throughout China, but none has yet been found infected either of this species or the closely allied *B. longicornis*, *B. spiralis*, or *B. chinensis*, though they may possibly act as intermediate hosts. *Melania hongkongensis* has, however, been shown to be infested.

The paper concludes with an interesting account of the powers of resistance of the cysts of this trematode. Thus, after 54 hours in strong salt brine partial plasmolysis takes place, but revival ensues after they are washed in tap water, and the cercariae are still infective; they were no longer viable after 6 days in strong native vinegar. Drying for 54 hours in Peking, whereby the fish-scales are rendered very brittle and the cysts highly plasmolysed, did not render them non-infective after washing in tap-water for an hour.

H. H. S.

KHAW (O. K.). **The Hatching Phenomena of Clonorchis Ova.**—*Proc. Soc. Experim. Biol. & Med.* 1925. May. Vol. 22. pp. 564–566.

Clonorchis ova hatch spontaneously when alternately frozen and thawed, when subjected to sudden rises in temperature, and when the tonicity of the medium is increased and then decreased. Drying, and an acid or alkaline medium (·1 per cent. HCl or NaOH) are very detrimental.

T. W. M. C.

MENGERT-PRESSER (Hilde). **Over** *Metagonimus Jokogawai* **in Ned. Oost-Indie. (Voorloopige Mededeeling.).**—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 178–186. With 6 coloured figs. on 5 plates. [5 refs.]; also in *Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1925. Pt. 1. pp. 21–26. With 6 figs. on 5 plates.

The author records finding this parasite in the intestine of 8 out of 12 cats and 4 out of 6 monkeys (*Cercopithecus*) but failed to find it in dogs. A description, with 6 coloured figures based on sections, is given.

R. T. L.

KELLAWAY (C. H.). **The Utility of the Casoni Reaction in the Diagnosis of Hydatid Disease.**—*Med. Jl. Australia.* 1925. Apr. 25. 12th Year. Vol. 1. No. 17. pp. 417–418.

Papers by this author, however short they may be, always contain much food for thought, and constitute a stimulus to further research. The intradermal reaction of Casoni yields results in two stages: (1) Within 10 minutes of injection there is produced a large wheal with spider-like outrunners, surrounded by a wide zone of erythema. This fades in an hour or so to be followed in 6–8 hours by (2) a very large area of erythema with infiltration and oedema of the subcutaneous tissues. Even though the greater part of the arm be affected there is no tenderness of glands, but only an almost negligible itching and heat with slight aching.

Attention has hitherto been chiefly paid to this second stage, which is often wanting when suppuration has occurred and after operation. The author finds that more reliance is to be placed upon the primary indications, since they are given in some 90 per cent. of hydatid cases, even in

those who fail to give a positive response to the complement fixation and precipitin tests. The two disadvantages of the test are, firstly, that since the fluid employed is obtained from sheep hydatids some subjects sensitive to sheep protein may give a positive reaction in the absence of hydatids; secondly, the cutaneous sensitiveness to hydatid protein may persist for years, and the test cannot be relied upon, therefore, to prove recurrence. For those patients who give a history of previous operation for this disease the complement fixation reaction is of more value for indicating residual or freshly developed cysts. A point worth noting is that the cutaneous reaction fails under anaesthesia in a considerable proportion of those who, prior to being anaesthetized for operation, gave a positive result.

From experiments carried out upon himself the author shows that the presence of free circulating antigen—hydatid fluid—does not interfere with the appearance of the primary wheal.

H. H. S.

Dew (Harold R.), Kellaway (C. H.) & Williams (F. Eleanor). **The Intradermal Reaction in Hydatid Disease and its Clinical Value.**—*Med. Jl. Australia.* 1925. May 9. 12th Year. Vol. 1. No. 19. pp. 471–478. [10 refs.]

This paper covers, though in greater detail, the same ground as that of Kellaway. The Casoni intradermal reaction, particularly in its early manifestation, is found to be of greater value than the complement fixation test as a diagnostic criterion in uncomplicated cases which have not been previously operated upon for hydatid, 92 per cent. yielding a positive result. A great advantage of the test is that suppuration and rupture of a cyst do not inhibit the primary reaction on which the authors lay chief stress, though the secondary phase may fail to appear. In post-operative cases the results are not to be relied upon, since the reaction may be manifest after many years.

H. H. S.

Deusch (G.). **Zur spezifischen Diagnostik der menschlichen Echinokokkenerkrankungen, insbesondere mittels der Intrakutanreaktion.**—*Deut. Med. Woch.* 1925. Aug. 7. Vol. 51. No. 32. pp. 1319–1320. [14 refs.]

The intradermal test was performed on nine patients with hydatid and numerous others as controls who were harbouring tapeworms, Ascaris, or Oxyuris, or were suffering from syphilis.

In all the former the reaction was positive, but in none of the controls. In three cases of pulmonary hydatid in which this test was positive complement-fixation gave negative results, and in a fourth the latter was at first doubtful, but later, *after* the intracutaneous inoculation, was positive. The intracutaneous test is, therefore, more reliable than that of complement-fixation. Of subsidiary value in diagnosis is an increase of eosinophiles after inoculation. This proved to be the rule in hydatid cases, but amongst controls it was evident on two occasions only: in a patient with *T. saginata*, and in one with phthisis who was undergoing insulin treatment for diabetes.

H. H. S.

Sette (Nicola). **Nuovo metodo di preparazione di antigene per la intradermoreazione di Casoni.**—*Policlinico.* Sez. Prat. 1925. Aug. 24. Vol. 32. No. 34. pp. 1175–1179.

The antigen employed by the author is prepared by evaporating to dryness, in a water-bath at 70° C., 150 cc. of hydatid fluid filtered through a candle. The residue is taken up in 10 cc. of 0·9 per cent. NaCl, and to this is added 20 cc. of glycerine. For the reaction, either intra- or hypodermically, 0·1 cc. of the product is used.

Of 7 patients in whom the clinical diagnosis was hydatid, 5 were found to harbour the cysts at operation ; of the other two, one had a renal tumour, and the other had been operated upon for hydatid a year previously. Of 46 controls, that is, patients suffering from conditions other than hydatid [the text states 42, but the Table gives 46], there were two yielding a slight reaction, a case of pulmonary abscess and one of enterocolitis, while a third, suffering from cholecystitis, gave a definite positive. The last patient refused operation, so it is quite possible that a hydatid also was present here.

H. H. S.

Cameron (Gordon) & Fitzpatrick (A. S.). **The Hydatid Cyst. The Micro-Chemical Reactions of the Hydatid Cyst Wall.**—*Amer. Jl. Path.* 1925. Mar. Vol. 1. No. 2. (Whole No. 2.) pp. 227–233. [10 refs.]

One of the authors (Dr. G. Cameron) published last year some work on the staining reactions of hydatid cysts [see this *Bulletin*, Vol. 21, p. 555]. The present paper is a further investigation into the chemical composition of various parts of the cysts by microchemical means. The subject is probably of greater interest to bio-chemists than to helminthologists or tropical practitioners, and it will suffice to give the chief of the authors' conclusions. The ectocyst of the hydatid cyst wall is rich in potassium, sodium and calcium, poor in iron, iodine, phosphates and chlorides ; the endocyst shows well-marked reactions to tests for each of these. As the age of the cyst advances the potassium and sodium salts diminish, while calcium salts, neutral and unsaturated fats, and lipoids increase ; glycogen is distributed throughout the whole of the cyst wall. Scolices microchemically resemble the endocyst.

H. H. S.

Rowe (J.). **A Case of *Cysticercus cellulosae* in Man.**—*Jl. Roy. Army Med. Corps.* 1925. Apr. Vol. 44. No. 4. pp. 291–293.

In view of the rarity of this infection, the author records a case admitted to the Citadel Military Hospital, Cairo.

The patient, a man aged 22, had been infected previously with *Taenia solium*, but had been cured in February, 1923. Since July, 1924, several small cysts had appeared in various situations in the subcutaneous tissues of the head, arms and trunk. On being excised they were found to be *Cysticercus cellulosae*. They were somewhat irregular in growth and distribution. When first observed they were about the size of a pea, but increased to about double this size in the course of a week, after which they were quiescent and caused no inconvenience.

T. W. M. C.

Desoil (P.). **Considérations sur l'échinococcose alvéolaire du foie en France à propos d'un cas nouveau observé dans le Pas-de-Calais.**—*Ann. Parasit. Humaine et Comparée.* 1925. Apr. Vol. 3. No. 2. pp. 151–170. With 5 figs. [3 refs.]

This is an interesting paper giving a review of the question of *Echinococcus alveolaris*. Its limited geographical distribution is mentioned, the chief endemic focus being Southern Germany, where the disease has been designated by Dévé "échinococcose bavaro-tyrolienne." The differential characters between it and ordinary hydatid are stated, in particular, the weak cuticularization of the former and its imperfect cyst-formation, absence of daughter-cysts and scarcity of scolices, its foldings and wanderings amongst the tissues owing to the thin and pliable cuticular layer, which also permits of more ready diffusion of toxin and so to greater local tissue reaction.

Hitherto, in France, only 14 cases have been reported, and of these Dévé excludes all but five. One of these, the "Ferréol case," should also be excluded as the patient had lived in Bavaria before coming to Paris. The remaining four are recorded in detail, and an additional case under the author's care.

This patient had never been in any of the districts regarded as endemic foci of the condition. Symptoms first appeared early in 1918—discomfort in the right side after exertion—and progressed slowly till jaundice was noticed in March, 1923, and a swelling found in the right hypochondrium. There was weakness with considerable loss of flesh. The liver extended from 3 fingers' breadths below the nipple to the same distance below the costal margin. The blood contained 7 per cent. eosinophilia. Operation was undertaken in June, 1923, but removal of the tumour was deemed impossible, so a fragment was taken for microscopical examination. The swelling extended rapidly with increasing emaciation, and death occurred on January 2nd, 1924. Photographs are reproduced which show well the histological changes present, particularly the folding of the thin cuticular wall and its laminated structure. Post-mortem examination was refused.

In the final sections of the paper the author discusses shortly the question of diagnosis, and that of the identity or otherwise of this form with the ordinary hydatid of man.

H. H. S.

Ross (Ian Clunies). **A Survey of Infestation with *Echinococcus granulosus* (Batsch) in New South Wales.**—*Med. Jl. Australia.* 1925. Mar. 14. 12th Year. Vol. 1. No. 11. pp. 253–258. With a map in text. [6 refs.]

Although Australia has long been notorious for the incidence of hydatid, little investigation has been undertaken in the last forty years to discover the extent of the infestation in man, stock and dogs. Ross has examined over 100 dogs in Sydney, with negative results. Of 50 dogs, however, from the districts in the country, where statistics showed that hydatid in man was prevalent, the adult tapeworm was found in 9; most of these dogs frequented slaughter-houses. About one-third of both cattle and sheep examined were infected with hydatid. The lungs were the seat of the cyst in 33, the liver in 12 cases.

T. W. M. C.

COLLIN (L.). **La sparganose oculaire en Annam.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 20–33. With 1 plate.

Collin finds that ocular sparganosis—due to *Sparganum mansoni*—is not uncommon in Annam and other parts of the Far East; and he discusses the clinical aspect of the cases which have come under his notice. He finds that it is often a serious disease which can only be treated surgically.

T. W. M. C.

WARE (Frank). **Some Parasitic Infections of Comparative Interest.**—*Jl. Comp. Path. & Therap.* 1925. June. Vol. 38. Pt. 2. pp. 89–91. [3 refs.]

This is a record of three cases of *Cysticercus cellulosae* and one of a sterile hydatid of the eye of man in India. Two of the cases of cysticercus occurred in the eye, and the third was in the brain.

T. W. M. C.

HERMANS (A. G. J.). **Een zeldzame vondst in een door operatie verwijderde appendix.** [A Rare Finding in an Appendix removed by Operation.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Apr. 11. 69th Year. 1st Half. No. 15. pp. 1725–1730. With 1 text fig. [16 refs.]

The author records the finding of two ripe proglottids of *Taenia saginata* in an appendix removed from a 21-year-old female patient, who was harbouring the parasite. The author believes these proglottids to have been the cause of the appendicitis, and reviews the records wherein cestode segments, oxyuris, whipworms, ascaris, etc., are reported to have been found in the appendix, and to have given rise to appendicitis.

R. T. L.

i. MOSTO (Domingo) & BOSQ (Pablo). *Taenia saginata* **fixé dans un intestin humain.**—*C.R. Soc. Biol.* 1925. July 3. Vol. 93. No. 23. pp. 256–259. With 3 text figs.

ii. NEVEU-LEMAIRE (M.) & DESCHIENS (R.). **Anomalie observée chez un** *Taenia saginata.*—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 267–269. With 1 text fig. [3 refs.]

iii. DORWARD (W. Fyffe). **Multiple Infection by Taenia.** [Letters, Notes & Answers.]—*Brit. Med. Jl.* 1925. June 27. p. 1202.

i. The authors have observed a *T. saginata* fixed to the human intestine, a small portion of the mucosa having been sucked into each sucker in a manner similar to that observed in experimentally-infected dogs.

ii. A record of a peculiar malformation in a *Taenia saginata* where the free end of the terminal segment had united with the edge of the 25th, and formed a firm ring.

iii. Dorward records the case of a Bedouin who harboured 16 adult specimens of *Taenia saginata*.

T. W. M. C.

Isobe. **On the Development of** *Taenia saginata.* **(II.).**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1925. Jan. No. 238. In Japanese. English summary p. 6.

Continuing the subject of a former paper the author discusses the systematic position of a Taenia which he had himself harboured, and which he regarded as different from *Taenia saginata.* It is not identical with *Taenia confusa,* and the author after consulting Dr. Joyeux is of opinion that it is a variety of *T. saginata.*

R. T. L.

Joyeux (Ch.). *Hymenolepis nana* **et** *Hymenolepis fraterna.*—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 270–280. [21 refs.]

The first part of this paper is a review of the recent work of Scott and others on the life-cycles of *Hymenolepis nana* in man, and *H. fraterna* in the rat. Joyeux considers it proved in both cases that the life-history is a direct one, and that the mammal is its own intermediate host. In the second part he examines the evidence for and against the view that both these forms belong to the same species. He considers that a definite decision based on morphology cannot be made as, owing to methods of collection of the human form, it is impossible to say if its anatomy differs from the rat form. He considers that Woodland's results, instead of proving that a single species exists, show that the human tapeworm is biologically distinct from the murine, and he points out that, though a laboratory animal may be experimentally infected with a parasite, a bacterium or a virus, it does not prove that it is a natural host. In this case, *H. fraterna* can be transmitted to the rat very easily; while *H. nana* can only be established with difficulty. Joyeux is definitely of the opinion that the human species, probably originally derived from the rat, is now biologically distinct. Both forms, however, develop without an intermediate host.

T. W. M. C.

Hongo (Gen-ichi). [**On the Developmental Cycle of** *Hymenolepis diminuta* **Rud.**]—*Tokyo Igakkai Zasshi* (*Jl. Tokyo Med. Soc.*) 1925. Feb. Vol. 39. No. 2. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 186–187.]

The cysticercoids of the unarmed Hymenolepis developed fully in the insect host in 23 days, and in the final host in 15 days. The author used experimentally albino rats. He demonstrated also by experiment and by observation of natural infections that 8 species of insects play the rôle of intermediate host, viz., *Pyralis farinalis, Aglossa dimidiata, Tinea pellionella, Tinea granella, Paralipsa gularis, Tribolium ferrugineum,* and two other species which have not been identified.

R. T. L.

Grönberg (Albert). **Ett fall av Bothriocephalus-anämi.** [A Case of Bothriocephalus Anaemia.]—*Hygiea.* 1925. July 15. Vol. 87. No. 13. pp. 497–503. With 1 text fig.

It is a curious but accepted fact that bothriocephalus anaemia does not appear to occur wherever the parasite is common in Scandinavia, but only in certain districts such as parts of Finland, and the most northerly part of Sweden.

The present case, in a man of 57 who had suffered from tapeworm for at least 20 years, came from Lulea in North Sweden. Only during the last six months were there symptoms of the pernicious type associated with some of the grave anaemias. The colour index reached as high as 1·67. After a relatively slight surgical operation his general condition rapidly got worse, and he was regarded as almost moribund. As the only chance of saving him seemed to be to cure him of the Bothriocephalus infection, and as he was too weak to undergo the cure, blood transfusion was resorted to. Twenty-four hours later he received 4 gm. *Extr. Aspidii Spinulosi* followed by 2 tablespoonfuls of castor oil in 3½ hours' time. Three specimens of Bothriocephalus were passed in the motions. Improvement began almost immediately afterwards, and in about 6 weeks the patient was discharged from hospital in excellent health and with a considerably improved blood picture. It is noteworthy that the eosinophils were never more than 3 per cent.

E. E. Atkin.

Grünmandel (Selma). **Bothriocephalus-Anämie im Kindesalter.**—*Monatsschrift. f. Kinderheilk.* 1924. Vol. 28. pp. 325–329. [8 refs.]

The case is recorded of a girl, 11 years of age, suffering from severe anaemia associated with the presence of Dibothriocephalus. The first time the blood was examined there were only 881,000 red corpuscles per cmm., with haemoglobin 18 per cent., and eosinophiles 8 per cent. Blood-transfusion brought about some improvement, but this was more rapid after a dose of 5 gm. of Ext. of Male Fern, which resulted in the expulsion of a worm 16 metres long [! even then the head was not found]. The erythrocytes rose in number to 2,500,000, and the haemoglobin to 55 per cent., a week later to 3,600,000 and 72 per cent. respectively. Infection with this worm is very rare in Breslau, and the case is recorded partly on that account.

H. H. S.

Leon (N.). **Accouplement et fécondation du** *Dibothriocephalus latus.*—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 263–266. With 2 text figs.

Leon has observed the phenomenon of copulation in a *Dibothriocephalus latus* placed in warm water immediately after evacuation. He finds that it is effected by the reciprocal superposition of two segments, when the genital pores come into contact and the cirrus is extruded. This sometimes results in the formation of the "knots" so frequently observed in the strobile.

T. W. M. C.

de Souza-Araujo (H. C.). [In Portuguese & English.] **As verminoses nas creanças do Paraná. Helminthiases of Children in the State of Paraná.**—*Mem. Inst. Oswaldo Cruz.* 1924. Vol. 17. No. 2. In Portuguese pp. 389–393. With 7 tables. In English pp. 395–399. With 7 tables.

In Parana, 83 per cent. of all children under 10 years old harbour hookworms, 91·5 per cent. ascaris, and 80·9 per cent. whipworms. Infections of the first two are found to decrease as the altitude increases and the temperature decreases; but no such relationship holds for Trichuris.

T. W. M. C.

DANHEIM (Bertha L.). **Studies on the Migratory Habits of Certain Nematode Larvae.**—Reprinted from *Trans. American Microscopical Soc.* 1925. Jan. pp. 14–23. With 13 figs. on 1 plate. [17 refs.]

From experiments on rats, Danheim concludes that, in general, the Ascaridae migrate through the body of the host, while the Oxyuridae (at least in the two forms from the rabbit studied) do not appear to leave the gut.

T. W. M. C.

VAN THIEL (P. H.). **De invloed van lage en zeer lage temperaturen op enkele parasitaire Nematoden.** [The Influence of Low and Very Low Temperature on some Parasitic Nematodes.]—*Tijdschr. v. Vergelijk. Geneesk. enz.* Leyden. 1925. Mar. 11. Vol. 11. No. 2. pp. 111–122. [7 refs.] English summary pp. 123–124.

Larvae of *Trichina spiralis* encapsuled in the flesh of guineapigs, when immersed in liquid air for a sufficient length of time to allow the flesh to assume the temperature of the liquid air, showed no signs of life on subsequent examination, neither were they able to bring about infection on being fed to rats and guineapigs.

Ensheathed larvae of *Ancylostoma caninum* were found all to be alive after 41 days when kept at 0° C.; after 8 months 4 per cent. of them were still alive. Under the same conditions, but under room temperature, the larvae all were dead in from 34–41 days. Larvae at ± −10 to −15° C. gave uncertain results. At −60° C. the larvae all were practically dead after 5 minutes. At the temperature of liquid air only a very small proportion of larvae showed signs of life even after an exposure of only two minutes.

The filariform infective larvae of *Strongyloides stercoralis* died in from 2–3 days when exposed to the temperature of melting ice. At −8° C. all the larvae were dead in 24 hours, at −10° C. the majority were dead after 4 hours, at −14 to −17° C. all were dead in 7 days, and all larvae were killed at the temperature of liquid air.

Four tables are given.

R. T. L.

LOW (George C.). **Recent Observations upon the Human Filariidae.**—*Jl. State Med.* 1925. Sept. Vol. 33. No. 9. pp. 415–418.

This paper, one of those read at the recent Congress at Brighton, reviews some of the later developments on the subject indicated in the title. The aims and results of the Expedition from the London School of Tropical Medicine to British Guiana in 1921 are mentioned, and the author adds some interesting observations of his own, culled from his work in the West Indies and his experience as Physician to the Hospital for Tropical Diseases. He demonstrates the need for caution in interpreting the results of the use of any special drug, since filarial embryos may be numerous on one day and few, or even absent, at a corresponding time on another. He found, as did the British Guiana Commission, that antimony injections have no effect upon the embryos in the circulating blood and *a fortiori* none upon the adults. This was proved to hold good for both *F. bancrofti* and *Loa loa*. The vaunted specific, Bayer "G. 1919," produced no beneficial results in his hands.

Attempts to invert the periodicity of *Loa loa* by changing the habits of the patient were ineffectual—an important point of distinction from what occurs with *F. bancrofti*.

Finally, the author indicates various lacunae in our knowledge of the life-history of *F. ozzardi*.

H. H. S.

TOMURA (T.). **Statistische Betrachtungen ueber Elephantiasis endemica auf den Inseln Lyukû (Japan).**—*Japan Jl. Dermat. & Urol.* 1925. June. Vol. 25. No. 6. German Summary pp. 82–84. In Japanese pp. 485–503. With 1 chart & 3 text figs. [7 refs.]

During the period 1912–1923 there were 254 cases of elephantiasis seen at the Okinawa Hospital in Lyukû. Twenty-seven of these were studied and treated personally by the author. The interval between the first febrile attack and the developed elephantoid condition was, on an average, 7–8 years. In this district the genitalia were affected in about three-fourths of the cases (76·3 per cent. of the males and 72·1 per cent. of the females). Among the author's 27 patients he was able to demonstrate filarial embryos in the peripheral blood of 5 only.

Among the 227 in whom the sex was stated, 151 were male, and 76 female, roughly 2 : 1. As regards age, 64 per cent. of the total were between 20 and 40 years, the proportion in each decade being practically the same, 32·4 and 31·6 per cent. respectively. 17·3 per cent. of those harbouring filarial embryos in their blood enjoyed perfect health.

H. H. S.

MONTPELLIER (J.) & LACROIX (A.). **Evolution de la gale filarienne (Onchocercose dermique).**—*Bruxelles-Méd.* 1921. Mar. 15. Vol. 1. No. 5. pp. 140–143. With 3 text figs. [4 refs.]

The authors state that craw-craw is definitely the result of intradermal filarial embryos and that these are the embryos of *O. volvulus*. Those presenting Onchocerca tumours are liable to violent attacks of prurigo, and examination of sections of skin taken at the time of the attack (not afterwards) reveal these embryos in the subcutaneous tissue. It is affirmed that a detailed examination of craw-craw cases will prove the presence of one or more Onchocerca tumours, and it is held that, therefore, the sudden afflux of Onchocerca embryos to the skin determines craw-craw. To this the authors apply the term "evolution of filarial itch."

H. H. S.

CASTELLANI (A.). **Observations on some Diseases of Central America.**—*Jl. Trop. Med. & Hyg.* 1925. Jan. 1. Vol. 28. No. 1. pp. 1–14. With 29 text figs. & 2 coloured figs. on 1 plate. [22 refs.]

This article contains an interesting paragraph, with some fine illustrations, on the worm nodules frequent in Guatemala, and due to *Onchocerca volvulus* (*O. caecutiens* of BRUMPT.). The eye symptoms associated with nodules are severe photophobia and signs of keratitis. In some cases the pupils are somewhat distorted, and do not react to light or accommodation, or only in a very sluggish manner. The fundi are generally normal. As the eye symptoms, in a series of

cases studied by the author, cleared up after removal of the nodule he is inclined to agree with Dr. CALDERÓN that there *is* some relationship—denied by FÜLLEBORN and others—between them.

R. T. L.

SERVICE (Stanley F.). **Loa Loa.**—*Clifton Med. Bull.* New York. 1924. Dec. Vol. 10. No. 4. pp. 163–166. [3 refs.]

Service records two cases of *Loa loa* in patients in America who had returned from West Africa in 1923. One had a worm removed six months after his first arrival in Africa. The other, who had never had Calabar swellings, showed no microfilariae ; and Service considers that this supports MANSON'S theory that the swelling is due to the birth of the larvae. She has now shown a rapid succession of the swellings, which does not agree with the theory that the cause is the death of the worm.

T. W. M. C.

DELAMARE (G.) & MOUCHET. **Calcification de la filaire de Médine. (Note radiologique).**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 318–319. With 1 text fig. [2 refs.]

A brief note demonstrating the value of radioscopic examination in determining residual calcified Dracunculus. Amongst 20 Senegalese riflemen so examined 4 were found to be thus infected. By repeated radioscopy the progression and retrogression of calcareous infiltration can be followed.

H. H. S.

MINISTRY OF HEALTH. **Reports on Public Health and Medical Subjects. No. 31. A Report on Infestation of the Human Subject by the Nematode Worm,** *Ascaris lumbricoides.* [COPEMAN (S. Monckton.]—20 pp. 1925. London : H.M. Stationery Office. [Price 6d. net.]

This is a record of a serious outbreak of Ascaris disease in a rural district in England. Infection was due either to the use of human excreta as manure, or else to the heavy infection in local pigs. The question of the existence of morphologically similar but biologically distinct species in man and the pig is discussed, and attention is drawn to LEIPER'S suggestion that the two forms are biologically distinct—a suggestion supported by the recent work of PAYNE, ACKERT and HARTMAN (*ante*, p. 488). In addition, the pathology of the disease is considered.

T. W. M. C.

PORTER (Annie). **A Note on the Life-Histories of** *Ascaris lumbricoides* **and** *Ascaris suilla* **in South Africa.**—Reprinted from *S. African Jl. Sci.* 1923. Dec. Vol. 20. pp. 347–350. [2 refs.]

The writer finds that the larvae of the human and porcine ascarids develop in South Africa as elsewhere. Larvae of *Ascaris lumbricoides* were obtained from the lungs of an experimental rat, 26 days after feeding. Several cases of intermittent lung trouble in children are recorded ; Ascaris ova were found in the stool and treatment with santonin or carbon tetrachloride was given ; with expulsion of the worms the lung troubles ceased.

T. W. M. C.

Ohba (T.). **Investigation on the Presence of Ascaris-Larvae in the Urine during the Initial Stage of Infection with Ascaris.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. May. No. 242. English Summary p. 2. [In Japanese.]

Ascaris larvae, when given to experimental animals, migrate from the intestine, and may reach the kidneys. They are always to be found in the urine in heavily-infected cases. Their earliest appearance is about 15 hours after infection, and they continue to be present for about 8 to 9 days. The 5th or 6th day after infection is the period of maximum output. At the time of excretion of the larvae the urine contains also blood corpuscles in more or less considerable quantity, but albumen reaction occurs only in heavy infections.

R. T. L.

Ohba (T.). **Experimental Study on the Morphological Changes of the Blood in Infection with Ascaris.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. Mar. No. 240. English Summary pp. 20–22. [In Japanese.]

Studies on the changes in the quantitative and morphological conditions during invasions with Ascaris larvae give the following results :—

1. Oligocythemia did not occur, but there were many cases of oligochromemia, and in such the condition of the animal was mostly serious and the termination usually unfavourable.

2. From the 1st to the 5th day after infection leucopenia arose in 83 per cent.—this, however, may have been the result of distributive leucocytosis—the white corpuscles were reduced to a quarter of the normal. Following the leucopenia, from about the 3rd to 9th day a temporary leucocytosis became manifest. In 62 per cent. of all cases the white corpuscles increased to more than twice the normal, reaching a maximum of 22,960. 25 per cent. of all cases showed no leucocytosis after the initial leucopenia. In 75 per cent. of the cases of leucopenia the lymphocytes were absolutely or relatively increased, the remaining 25 per cent. were both lymphopenic and leucopenic. The leucocytosis appeared as pseudo-eosinophilia. All cases which had passed the 5th to 8th day after infection showed eosinophilia. 60 per cent. of all very serious cases showed terminal leucopenia. The normal condition of the blood became restored only after 40 days. Eosinophilia persisted to the 20th or even 30th day. Essentially the same changes, though slighter and slower in character, follow the subcutaneous injection of body cavity fluid or an emulsion of Ascaris.

R. T. L.

Ogata (Seiji). [**On my Method of Extermination of the Ascarid Eggs. Communication II. Experiments on the Resistance of the Ascarid Eggs against Heat.**]—*Osaka Igakkai Zasshi* (*Jl. of Osaka Med. Soc.*). 1924. Dec. Vol. 23. No. 12. [Summarized in *Japan Med. World.* 1925. Mar. 15. Vol. 5. No. 3. p. 74.]

——. [**On my Method of eradicating Ascaris Eggs. Communication III. The Experimental Investigation on the Resistance of the Ascarid Eggs against Heat.**]—*Osaka Igakkwai Zasshi* (*Jl. Osaka Med. Soc.*). 1925. Feb. Vol. 24. No. 2. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 188–189.]

Testing the viability of eggs by cultivation the author found that Ascaris eggs were killed in water at over 75° C. in one second and would become positive to Sudan staining, whereas living Ascaris eggs do not stain with

Sudan III. Hot water at 70° C. kills Ascaris eggs in one second, at 65° C. it takes more than 50 seconds, at 50° C. more than three-quarters of an hour. Below 45° C. the eggs were not killed even after one hour or more. (The figures given in the earlier paper are somewhat lower.)

R. T. L.

i. Slater (William Kershaw), with a note by Wollard (H.). **The Nature of the Metabolic Processes in** *Ascaris lumbricoides*.—*Biochem. Jl.* 1925. Vol. 19. No. 4. pp. 604–610. [5 refs.]

ii. Stiven (H. E. S.). *Ascaris lumbricoides* **and Pigs.** [Correspondence.]—*Lancet.* 1925. Sept. 5. p. 523.

iii. Cram (Eloise B.). **The Egg-Producing Capacity of** *Ascaris lumbricoides*.—*Jl. Agric. Res.* Washington. 1925. May 15. Vol. 30. No. 10. pp. 977–983. With 6 text figs. [5 refs.]

i. Slater finds that the pig ascarid is not anaerobic as was believed by Weinland, but that in the absence of oxygen it has the faculty of suppressing animation—even at 37° C., a much higher temperature than that associated with similar processes in other animals.

ii. About 90 per cent. of the Egyptian population in Port Said suffer from *Ascaris lumbricoides*, and the writer suggests that this may be due to the large number of pigs bred there.

iii. Cram finds from a dissection of two *Ascaris lumbricoides* that the egg content lies between 26 and 27 millions—a much lower estimate than that made by the older workers.

T. W. M. C.

Moutier (François). **La neurasthénie ascaridienne.**—*Jl. Méd. Français.* 1924. Sept. Vol. 13. No. 9. pp. 372–373. [4 refs.]

Moutier puts on record three cases of neurasthenia, all symptoms of which disappeared on anthelmintic treatment for Ascaris. In two of the cases a single worm was expelled, while in the other only three immature forms were found. He considers that helminths are often overlooked as causes of obscure disease, and quotes Nicolas (1701) as saying, "one does not search sufficiently carefully for worms in an invalid; and accordingly several persons of various ages have fallen sick from want of treatment or preventive measures against helminths, without the real cause being known." He considers that this dictum is still true, but is often forgotten.

T. W. M. C.

Labbé (Marcel) & Denoyelle (L.). **Ictère et ascaridiose.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. May 7. Year 41. 3rd Ser. Vol. 49. No. 15. pp. 653–655. [8 refs.]

A woman, 20 years of age, developed jaundice rapidly. It was of the obstructive type and was generalized within four days of the first icteric tinge of the sclerotics being noticed, but was unaccompanied by any pain, rise of temperature or digestive disturbance. Spontaneous expulsion of ascarides led to temporary improvement, and further treatment with thymol led to the removal of 14 more worms, after which cure was rapid. This case differs from the majority of those recorded in that pain and fever associated with the cholangitis usually set up by the presence of these parasites in the biliary tract were absent.

H. H. S.

Pfanner (W.). **Ascaridiasis und Pankreatitis acuta.**—*Deut. Ztschr. f. Chirurg.* 1924. Vol. 187. pp. 125–132. [8 refs.]

The author describes and discusses two cases of acute pancreatitis due to Ascaris infection. In both, the onset of symptoms was very acute with abdominal pain. The first was diagnosed as acute cholangitis and cholecystitis, the second as perforated gastric ulcer. The first died 10 days after operation at which cholecystitis was found, but no evidence of pancreatitis. At the autopsy an ascaris was found in the pancreatic duct and passing to the middle of the gland. The second patient died while the anaesthetic was being administered, before the operation was begun. Post-mortem examination revealed 20 ascarides in the stomach and duodenum and 2 in the ductus choledochus, blocking the papilla of Vater.

H. H. S.

Scriabin (K. J.) & Pashin (A. N.). **"On Cases of Liver Ascaridosis in a Child."**—*Russian Jl. Trop. Med.* 1924. No. 4–5–6. English Summary p. 122. [In Russian.]

A case is described in which there was found at a post-mortem on a child several adult Ascaris in the bile ducts, particularly in the left lobe of the liver. There were also in the tissue of the liver several abcesses in a pre-suppurative stage and in one an adult *A. lumbricoides* was found.

R. T. L.

Tankoff (W. E.). **"About Semiotics and Therapie of Ascaridosis."**—*Russian Jl. Trop. Med.* 1924. No. 4–5–6. English Summary p. 121. [In Russian.]

Of four cases of infant ascariasis in the Wladimirskaia Gouvt. (North Russia) recorded by the author two were fatal. One showed, at post-mortem, an adult Ascaris in Wirsung's duct, and in the second case adult worms blocked the hepatic and cystic ducts.

R. T. L.

Maitra (Jitendra Nath). **A Case of Jaundice showing Round Worms in the Liver and Gall-Bladder.**—*Calcutta Med. Jl.* 1925. Apr. Vol. 20. No. 10. pp. 390–391. With 2 plates.

The post-mortem findings in a fatal case of jaundice are described. At the autopsy the upper part of the intestine was seen to contain a large number of nematodes [the nature of them is not stated]. Three similar worms were present in the gall-bladder, and these were believed to have penetrated thither directly from the bowel, while others had migrated further up the bile-passages into the liver itself.

H. H. S.

Wilhelmi (J.) & Quast (Marg.). **Ueber die Verbreitung und den Nachweis der Oxyuriasis.**—*Klin. Woch.* 1925. May 14. Vol. 4. No. 20. pp. 964–967. [20 refs.]

Oxyuris eggs live only for a very short time in water and faeces, so that there is no danger from baths, etc. Flies are not important as carriers. Diagnosis from faeces removed from the rectum is unsatisfactory; better is an examination of the finger nails of children (the scrapings are washed in ·5 to 1 per cent. caustic soda, centrifuged, and examined under the microscope). An examination of the three middle fingers of children gave 61 per cent. positive results for one

school. Children who bit their nails gave negative results. Examination of the nasal mucosa in a school of 25 gave four positives, three of these being children with short nails.

Wilhelmi and Quast find that adult worms live (at 37° C.) for two hours in water, two days in physiological saline, 5 days in Ringer's solution, and 9 days in alkaline bouillon which is changed every 12 hours. Ova hatch in bouillon in 14 hours; by adding 1 per cent. pepsin this period is reduced to 9 hours.

T. W. M. C.

VERNE (J.). **Réactions particulières de l'appendice iléo-caecal provoquées par l'***Oxyuris vermicularis* **L.**—*Bull. Soc. Zool. de France.* 1924. Vol. 49. p. 86.

At a meeting of the Society in February, 1924, the author showed stained sections of a child's appendix containing *Oxyuris vermicularis*. The specimens were females with immature ova. Their presence had set up inflammatory reaction with evidence of ciliation of intestinal epithelium and marked local eosinophilia. The intestine of the parasites contained ingested erythrocytes and the lumen of the appendix also contained red corpuscles resulting from bites of the worms.

H. H. S.

ASADA (Junichi). [**A Supplemental Study on the Development of Oxyuris.**]—*Okayama Igakkwai Zasshi* (*Jl. Okayama Med. Soc.*). 1925. Jan. No. 420. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 190–191.]

By experiment with the Oxyuris of man and that of the rat the author has ascertained that mature fertilized Oxyuris eggs hatch in room temperature (25°-30° C.) in 7 days or thereabouts. They also hatch in the stomach and chiefly in the upper part of the small intestine within half-an-hour to five hours. The hatched larvae do not attempt to migrate into the tissues of the body, but remain in the intestine and attain full growth.

R. T. L.

GROVE (J. S.). **The Use of Antimony and Potassium Tartrate in Trichinosis.**—*Jl. Amer. Med. Assoc.* 1925. Aug. 1. Vol. 85. No. 5. pp. 349–350. [5 refs.]

A case of trichinosis treated during the invasion stage when embryos could be demonstrated in the blood is put on record. 1 cc. of freshly prepared 2 per cent. sterile solution of antimony potassium tartrate was given intravenously, followed next day by 2 cc., and on the day after by 3 cc. Two days later 4 cc. were given. As the temperature had returned to normal and muscular tenderness had disappeared by the following day, the patient was discharged.

R. T. L.

OUDENDAL (A. J. F.). **Over slijmvlies-veranderingen door den** *Trichocephalus Dispar* **veroorzaakt.** [On Changes in the Mucosa caused by *Trichocephalus dispar.*]—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 110–124. With 11 coloured figs. on 6 plates.

After reviewing the work done by previous workers on the effects of the whipworm on the mucosa of the host, the author deals with

his own observations made on material obtained from the bodies of Indians and Chinese. He comes to the following conclusions :—

1. A syncytium of so-called giant cells is formed round the anterior portion of the worm : this syncytium is formed primarily by epithelial cells, but polymorphonuclear leucocytes may sometimes also be involved in its formation.

2. The parasite does not bore or tunnel into the mucosa ; it remains in the superficial layers.

3. The parasite inserts its head into the lumen of a gland, and, thus fixed, it rolls itself round its longitudinal axis, and in so doing gathers round it cells from the epithelium, which cells lose their individuality, become a syncytium, and form a kind of closed groove simulating a tunnel.

R. T. L.

Sagredo (N.). *Trichocephalus dispar* **in der Darmwand.**— *Virchows Arch. f. Path. Anat. u. Physiol.* 1925. Vol. 256. No. 1. pp. 268–274. With 4 text figs. [18 refs.]

The author, from an examination of bodies carried out soon after death, found that Trichuris is not always free in the intestinal canal, nor merely buried in the mucus, but that the worm does actually penetrate the mucosa, sometimes the head end being inserted, sometimes the tail, while occasionally the whole worm lies in a sort of tunnel in the wall of the intestine.

H. H. S.

Hasegawa (Tokuzo). [**Experimental Studies on the Development of Trichocephalus.**]—*Fukuoka Ikadaigaku Zasshi* (*Jl. of Fukuoka Med. Soc.*). 1924. Aug. Vol. 17. No. 8. [Summarized in *Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. p. 105.]

After 28 days in the incubator at 28°–30° C. fully developed larvae of Trichocephalus were obtained. With a 30–50 day culture vigorous infection was obtained, although even a 28-day culture was infective. In the incubator the larvae lived within the egg shell for even 120 days. The eggs hatch and the larvae invade the mucosa of the small intestine in 2½ hours after feeding. They apparently enter the caecum in 70 hours after the ingestion of the eggs.

R. T. L.

Deschiens (R.) & Taillandier (O.). **Présence de larves rhabditoïdes de** *Strongyloïdes stercoralis* **(Bavay, 1877) dans le liquide duodénal recueilli par tubage. Considérations cliniques sur l'anguillulose.**— *Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 525–527. [4 refs.]

Intermittent attacks of diarrhoea associated in some cases with a condition of neurasthenia are common in infections with *Strongyloides stercoralis*, but in a case under the author's care the symptoms were strongly suggestive of duodenal ulcer. X-ray examination after a barium meal showed thickening of the duodenal wall and the duodenal contents removed by Einhorn's tubage method revealed embryonated eggs and numbers of living rhabditiform Strongyloides larvae.

H. H. S.

Torres (C. Magarinos). **Déterminisme de la libération spontanée des larves d'** *Habronema muscae* **(Carter, 1861), par la trompe de la mouche domestique ; importance de l'hématotropisme.**—*C.R. Soc. Biol.* 1925. June 12. Vol. 93. No. 20. pp. 33–35.

——. **L'hématotropisme des larves mûres d'** *Habronema muscae* **(Carter, 1861).**—*Ibid.* pp. 38–39.

——. **Sur l'habronémose pulmonaire expérimentale.**—*Ibid.* June 26. No. 22. pp. 214–216. [2 refs.]

Roubaud and Descazeaux have shown that the Habronema of the horse can be liberated from the proboscis of the intermediate host—the house-fly—under the influence of heat and humidity. Torres shows that it will be freed spontaneously on contact with cold defibrinated horse blood ; and he believes that blood and humidity may be essential conditions of release. The blood of other animals (including man) has no effect on the larvae. He finds also that larvae deposited on an artificial sore in a guineapig reach the lungs and form a nodular peribronchitis. He considers that the larvae have a definite tropism for the lungs.

T. W. M. C.

Sandground (J. H.). **Observations on** *Rhabditis hominis* **Kobayashi in the United States.**—*Jl. Parasit.* 1925. Mar. Vol. 11. No. 3. pp. 140–148. With 1 plate. [6 refs.]

Rhabditis hominis, first recorded from Japan, and now found in America (1923), is believed by Sandground to be a free-living coprophagous species. He has found it not only in human stools, but also in the droppings of small mammals—but only when the stool was collected *without* precautionary measures to avoid contamination. Repeated infection experiments on the human subject have proved negative. A detailed account of its anatomy is given, and attention is drawn to its similarity to and differentiation from Strongyloides.

T. W. M. C.

Yokokawa (Sadamu). [**On the Gongylonema newly discovered in Formosa.**]—*Taiwan Igakkai Zasshi (Jl. of Formosan Med. Soc.).* 1924. Sept. No. 236. [Summarized in *Japan Med. World.* 1925. Mar. 15. Vol. 5. No. 3. p. 76.]

The specimen named *Physaloptera formosana* by the author in 1920 bears a very close resemblance to Fibiger's *Gongylonema neoplasticum*, and he re-names it *G. neoplasticum orientale*. The male attains maturity in 20 days, the female in 35 days, whereas *G. neoplasticum* takes two months to reach egg-laying.

R. T. L.

Gallagher (Joseph F.). **Hookworm in Porto Rican Soldiers in Panama.**—*Milit. Surgeon.* 1925. Apr. Vol. 56. No. 4. pp. 430–447. [5 refs.]

This article is very interesting, perhaps all the more so in that it is somewhat subversive of the usual tenets of the anti-hookworm enthusiasts, and should lead to considerable discussion. 90 per cent. of the rural population of Porto Rico is infected with hookworm, and the author investigated the incidence and effects of this parasite

in 203 recruits and 55 re-enlisted men. Of those coming from the towns 78·2 per cent. were infected, of those from the country, 90·2 per cent. The examination was made from direct smears of the faeces; in the event of two negative smears "a concentration method" was employed. In all, 83·5 per cent. were positive; of the recruits, 84·2, of the re-enlisted men, 81 per cent. The degree of anaemia, though an indication of the severity of symptoms, is not an index of the severity of infection; sometimes those with many worms showed little anaemia, while others with few showed a greater degree.

The anomalies are interesting. The recruits were rated, according to their aptitude, intelligence and the results of physical tests, into superior and inferior, and it was found that of 23 men in the "superior" group 91·3 per cent. harboured hookworms, and had an average haemoglobin percentage of 71·7, while of 27 men in the "inferior" group 88·8 per cent. were infected and had 72·9 per cent. haemoglobin. That is, the former, in spite of the higher incidence and lower haemoglobin, were better mentally and physically than the latter. Further tests were carried out as to strength, endurance, speed, co-ordination of muscles with eye and ear respectively (Professor KEMBLE'S tests), and again it was found that the "negative for hookworm" group came out lower than the positive.

The form of treatment adopted was that by carbon tetrachloride (since 1923; prior to that, oil of chenopodium or thymol was used). 3 cc. was the dose, given in gelatin capsules, followed two hours later by a purge of magnesium sulphate. Warning is given that alcohol should be avoided and preferably no other medicament at the same time, quinine being particularly mentioned.

H. H. S.

FELIX (A.). **Hookworm in Palestine.**—*Harefuah.* Jerusalem. 1925. Apr. Vol. 1. No. 4–5. English summary, p. IX. [In Yiddish pp. 207–211.] [3 refs.]; also in *Amer. Jl. Trop. Med.* 1925. July. Vol. 5. No. 4. pp. 291–296. [3 refs.]

Felix states that, although Palestine has never been recorded as an endemic centre of hookworm disease, he has found a number of cases in Petach-Tikvah in men who have never been out of the country. Soil pollution is not yet heavy, but conditions are favourable for the spread of the disease. The Palestine hookworm appears to be *Ancylostoma duodenale*.

T. W. M. C.

CHANDLER (Asa C.). **The Measure of Hookworm Infection in Communities.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 191–210. [18 refs.]

Chandler points out that the percentage of individuals in whose stools hookworm ova occur does not give a real guide to the severity of the infestation; and that it is necessary to know also the degree of infection. The prevalence is measured by means of the Kofoid-Barber technique. The degree of infection is found by counting the egg output (using a modified Stoll technique). He finds that formed stools contain twice, liquid stools half, as many eggs as mushy stools. After making this correction, the number of eggs varied daily; but if counts were made on three successive days and the average taken,

the resulting figure was fairly constant. The incidence of infection gives an idea of the extent to which the community is exposed to infection: while the degree of infection is a measure of the facility with which infection can occur in individuals. Chandler proposes to unite both these factors to obtain an Infection Index. He finds this by using the formula,

$$\text{Index} = \sqrt{\frac{\text{e.p.g.}}{100} \times \%^2}$$

where e.p.g.=average eggs per gram,
and % =percentage infected.

T. W. M. C.

Chandler (Asa C.). **The Migration of Hookworm Larvae in Soil.**—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 105–108.

Chandler has made experiments on hookworm larvae in order to test the conclusion reached in America by Augustine, Cort, and Payne. He finds that lateral migration in soil is practically absent; but that even the light sprinkling of water on the surface is sufficient to distribute the larvae mechanically. Larvae tend to climb through coarse soil under conditions which indicate that this is due to a negative geotropism rather than to the upward flow of water. He finds also that migration up the side walls of an earth latrine is very slight indeed.

T. W. M. C.

Hopkins (G. H. E.). **The Clayton Lane Technique used in the Field to control Hookworm Treatment.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Feb. 19. Vol. 18. No. 8. pp. 428–431.

A series of 54 specimens taken at random from the patients and staff of the Apia Hospital, Samoa, was used for comparing the relative values of the Clayton Lane and the Willis techniques. The former detected 92·6 per cent., the latter 87 per cent. For the diagnosis of the lightly infected the difference was much more marked, the former yielding a positive result in 14, the latter in 4 only, of 19 specimens.

A more extensive examination of the population was then carried out, using the Clayton Lane technique. Of 333 persons examined, 322, or 96·7 per cent., proved positive, with an average of over 70 eggs per cc. of faecal emulsion per person. These were given a mixture of oil of chenopodium (1 part) and carbon tetrachloride (3 parts) up to a maximum of 35 minims according to age and general health. Magnesium sulphate, 1 oz. in 4 ozs. water, was given at the same time. Three weeks later 309 of these were re-examined, and though 59·2 per cent. were still infected, the average number of eggs was only 10·9 per cc. After another 3 weeks a third examination was made, and 37·4 per cent. were still uncured, but the infection was much lighter, namely, one egg in 5 cc. of faecal emulsion. The investigation, however, proves that the Clayton Lane apparatus can be usefully employed in the field, the only drawback being one which is probably easily remediable—the corrosion of the aluminium arms of the centrifuge by the salt solution.

H. H. S.

SWEET (W. C.). **Notes on Methods of diagnosing Hookworm Infection and on Egg-Counting Methods.**—*Amer. Jl. Hyg.* 1925. July. Vol. 5. No. 4. pp. 497–507. [7 refs.]

This paper consists of two parts. In the first the question of the relative values of the Willis, the Stoll, and the Clayton Lane methods for diagnosis of hookworm infection is considered; in the second, estimation of the degree of infection is made by the latter two methods.

For diagnostic purposes Clayton LANE's technique proved the best, giving about 1·5 per cent better results than WILLIS's, and 14 per cent. better than STOLL's. Where infection is very light the superiority of the Clayton Lane method is still greater. Of 20 specimens from persons harbouring apparently only one female worm the ratios were 75, 55 and 40 per cent. for the Clayton Lane, Willis and Stoll respectively. For ordinary infections the Willis method, being more rapid and needing no special apparatus, more than compensates for the slightly greater accuracy of that of Clayton Lane. Worm-count methods were found to be much less accurate than those by ordinary microscopic means.

In the second part of the paper a large number of figures are given as to the degree of infection of individual patients according to the character of the stools. The findings are shown to be liable to considerable individual variation, so that egg-counting methods for estimating the degree of infection will be of greater value when applied to large groups than to individuals. The author concludes by saying that " on the basis of the series of counts here reported, the Stoll method would seem to be slightly preferable to Clayton Lane's direct centrifugal flotation method, but further experience with the latter method may alter this conclusion."

H. H. S.

STOLL (Norman R.) & TSENG (Hsien-Wu). **The Severity of Hookworm Disease in a Chinese Group, as tested by Hemoglobin Readings for the Anemia, and Egg Counts for the Degree of the Infestation.**—*Amer. Jl. Hyg.* 1925. July. Vol. 5. No. 4. pp. 536–552. With 1 text fig. [9 refs.]

The authors directed the carrying out of two sets of tests—egg-counts (Stoll's method) and simultaneous haemoglobin readings (Tallquist scale)—on 337 individuals in order to decide whether there is a definite correlation between them. Causes of anaemia other than hookworm infection, it was found, could be to some extent disregarded. Schistosomiasis was absent from the district whence the patients came, dysentery was not an important factor, malaria was widespread and the whole group is inferred to be " rather uniformly malarialized," so that malaria was probably the cause of the low haemoglobin values in patients negative for hookworm, and also influenced the other Hb. results irrespective of the egg-counts.

With a wealth of mathematical data it is shown that the haemoglobin values varied between 64·3 per cent. in the slightly infected (500 eggs per gm., " basis of formed faeces "), and 30 per cent. in the heavily infected (150,000 eggs or more), the hookworm-negative cases having an average Hb percentage of 66–67.

H. H. S.

Goodey (T.). **Observations on Certain Conditions requisite for Skin Penetration by the Infective Larvae of Strongyloides and Ankylostomes.**—*Jl. Helminthology.* 1925. May. Vol. 3. No. 2. pp. 51–62. [15 refs.]

The larvae of *Strongyloides* and *Ancylostoma* differ in that the former are sheathless, the latter are enclosed in a sheath. They differ remarkably in their capacity to penetrate skin, for while the sheathless larvae of *Strongyloides* can enter skin very rapidly both downwards and upwards in a considerable depth of water, the larvae of *Ancylostoma* can only enter the skin if the layer of water is sufficiently shallow. The author relates ingenious experiments which have enabled him to emphasize the fundamental character of these biological differences.

R. T. L.

Goodey (T.). **Skin Penetration by the Infective Larvae of** *Dochmoides stenocephala.*—*Jl. Helminthology.* 1925. Aug. Vol. 3. No. 3–4. pp. 173–176. [5 refs.]

It has recently been shown by Cameron that the hookworm of the sheep forms an exception to the general rule that hookworm larvae penetrate the skin. Apparently the larva of another common hookworm, viz., *Dochmoides stenocephala* of the dog, has not been investigated. Goodey has experimentally proved by his "cork raft" technique not only that the larvae of this species is a skin penetrator, but that in penetrating the skin it does so without exsheathing, thus differing from the larvae of *Ancylostoma duodenale*, *A. caninum* and *Necator americanus*, which leave the sheaths upon the surface of the skin.

R. T. L.

Yokogawa (S.) & Oiso (T.). **Investigation on the Life-History of Ankylostoma and** *Strongyloides stercoralis.* **On Oral Infection with Ankylostoma. [1st & 2nd Reports.]**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. Apr. & June. Nos. 241 & 243. English summary p. 1. [In Japanese.] Also *Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1925. May. No. 2418. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. p. 184.]

If ankylostome larvae are given by the mouth to guineapigs, rabbits or mice, the majority penetrate into the stomach or oesophageal mucosa and take the course through the lungs, but in dogs such migration takes place only in very small numbers. The authors give an account of their experiments on dogs. These are designed to show that two different courses of migration are taken by hookworm larvae when given by the mouth. A puppy, about 40 days old, was given a dose of about 1,000 larvae of *A. caninum*. Two hours later the trachea was severed, and 51 hours after infection the animal was killed. Four larvae were found in the oesophagus, 169 in the stomach, 639 in the small intestine, but none in the lungs or other parts of the body. The great majority of the larvae were little developed, with a primordial mouth capsule. Another, slightly older dog was operated upon in the same way, then infected with about 3,500 larvae, and killed 5 days 15 hours after infection. 3,053 young worms were then found in the small intestine and, corresponding with the longer period, at a more

advanced stage of development, some showing already sexual differentiation. The authors think that migration of the larvae through the lungs may be without any special meaning for their development.

R. T. L.

Roskott (E. R. A. Luyke). **Stollingstijd en aantal bloedplaatjes bij Mijnworm- en Malaria-anaemieën.** [Coagulation Time and Number of Blood Platelets in Hookworm and Malarial Anaemia.]—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 194–200. [7 refs.]

The author used Duke's method, which provides that all the observations are carried out at about the same temperature. He found that in the tropics, with blood from normal healthy individuals, there was considerable variation in the coagulation time, extending from a minimal period of 8 minutes to a maximal period of 19 minutes 20 seconds. In anaemia caused by the various tropical ailments there was also a very marked variation in the time required. Thus with tertian malaria a maximum of 23 minutes as well as a minimum of 4 minutes was obtained.

The number of thrombocytes (blood platelets) in normal blood varied from 180,000 to 460,000, with an average of about 250,000 per cmm. These two extremes both gave the longest coagulation time, 19 minutes 20 seconds and 19 minutes respectively. As a rule, in malaria patients showing parasites in the blood and possessing enlarged spleen, there was a reduction in the number to less than 200,000 per cmm ; whereas in patients suffering from ankylostomiasis, but having a normal or only very slightly enlarged spleen, the number was always above 200,000 per cmm.

He concludes that there is no relationship between the coagulation time and the number of thrombocytes.

A table is appended.

R. T. L.

Pearson (H. R.). **Hookworm Disease and the General Practitioner.**—*Med. Jl. Australia.* 1925. Mar. 28. 12th Year. Vol. 1. No. 13. pp. 314–315. [1 ref.]

A short paper of general remarks upon the subject of hookworm, with a few words telling the general practitioner how to examine for ova in the faeces. Under a plan now in operation it is hoped to obtain the help of the practitioner by prevailing upon him to send in notes of the clinical findings and the treatment adopted, so that when members of the hookworm unit examine the patients later the efficacy of the various drugs employed may be estimated.

H. H. S.

Moukhtar (Akil) & Sedad. **Sur l'existence de l'ankylostomiase en Turquie.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 265–267.

The case is reported of a woman of 22 years, a native of Tireboli (Trébizonde), suffering from marked anaemia—erythrocytes 748,000 per cmm., haemoglobin 12 per cent. The stools contained 4-6 hookworm ova per field. Eosinophiles were 6·4 per cent. A little improvement occurred on treatment with thymol, but relapse followed, and within a month of her first being seen she died ; the red cells then were only 500,000 per cmm. Numerous ankylostomes were found at the autopsy.

H. H. S.

Tamiya (Teijin). [**On the Varieties of Ancylostoma and Statistical Relation between the Infection from the Female and Male Worms, as they are met with in the Village.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1925. May. No. 2421. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 184–185.]

The hookworms present in a farming village of Saitama prefecture, Japan, were mainly *Necator americanus*. The ratio of male to female worms was 1 : 1·3.

R. T. L.

Yoshida (S.) & Momma (K.). [**Ancylostomiasis among Miners. Communication I.**]—*Osaka Igakkwai* (*Jl. Osaka Med. Soc.*). 1925. Feb. Vol. 24. No. 2. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. p. 189.]

The English summary merely states that the Japanese text gives statistical figures regarding the disease.

R. T. L.

Soper (Fred L.). **Factors which should determine the Selection of an Anthelmintic in a Geographical Area.**—*Amer. Jl. Hyg.* 1925. July. Vol. 5. No. 4. pp. 408–453. With 10 charts in text. [20 refs.]

The aims of this long contribution are worthy of all praise, namely, to show from examination as to the nature and degree of helminthic infection, from the habits and customs of the inhabitants, and the presence of concomitant diseases, what is the best drug or combination of drugs, and the optimum safe dosage to be used in any given geographical area. These points are illustrated by a report on work in the Republic of Paraguay. The matter, however, is rendered so complicated by tables and masses of figures, the confusion of which is not materially simplified by the employment of what are designated "arithlog grids," that we can do little more than abstract the author's conclusions and summary.

Infestation among Paraguayan soldiers is high. Of the worms found, over 90 per cent. were Necator, and this is ascribed to the occupation of the country by the Brazilian Army, with its heavy infection, following the Paraguayan war; Ascaris infects about 11 per cent. and Trichuris 43·4 per cent.

Oil of chenopodium and carbon tetrachloride both have a species and sex selective action on Necator and Ancylostoma, and both are more active against the former. Chenopodium is more efficient for males, carbon tetrachloride for females. Thus, in decreasing order of resistance, it was found as follows :—

Oil of Chenopodium.	Carbon tetrachloride.	Combination of 2 pts. CCl_4 and 1 pt. oil of chenopodium.
Female *Ancylostoma.*	Male *Ancylostoma.*	Female *Ancylostoma.*
Male *Ancylostoma.*	Female *Ancylostoma.*	Male *Ancylostoma.*
Female *Necator.*	Male *Necator.*	Male *Necator.*
Male *Necator.*	Female *Necator.*	Female *Necator.*

If concentrated magnesium sulphate is administered at the same time as the mixed drug, the ultimate anthelmintic result is not

impaired, but expulsion is delayed. 1·5 cc. of a 2 to 1 mixture in a single dose with simultaneous magnesium sulphate proved very efficient for Necator ; in heavily infected areas 2·5 cc. may be given as a dose for adults. For Ancylostoma the best results were obtained with a 9 to 5 mixture (1·8 cc. carbon tetrachloride to 1 cc. of oil of chenopodium).

The worm-count method of Darling proved to be superior to the Willis or Stoll method for diagnosis, while it is indispensable for determining the degree and character of infestation, and the sex and species selectivity.

In the course of 36,000 treatments only five cases of poisoning were encountered, four alcoholics and one child heavily infected with Ascaris. Of these five two were fatal, the child dying with symptoms of intestinal obstruction.

H. H. S.

Lallemant (M. Avé). **De Ankylostomiasis in Manggarai en hare bestrijding.** [Hookworm Disease in Manggarai and the Campaign against it.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 3. pp. 395–411. With 7 text figs. & 1 plate.

Manggarai, the western part of Flores (Minor Sunda Islands), is a mountainous country with volcanic or limestone soil. The native population lives under primitive conditions, and has very uncleanly habits. Many families, with up to 200 or 300 individual members, live together in one house. At night the Manggarai native does not leave his house. He deposits his faeces through the bamboo floor on the earth underneath, where it is ingested by his pigs ; there is not much evil smell, but the soil under the houses is moist and heavily infected with nematode larvae. The room under the house is used as a foddering place for the pigs, as a barn, and as a playground for the children.

The author found a high infection index of the natives by the single microscopical examination of samples of faeces, and serious infection of the soil under the houses (Baermann's method). Native coffee plantations commonly used for defaecation in daytime were also found to be infested.

Villages near the coast, consisting of small houses, were found to to be only slightly infected. Of native policemen, wearing shoes, only few were found to harbour the hookworm.

A hookworm campaign in such a district met with considerable difficulties. Some of the villages have been demolished, rebuilt with single family houses, and provided with latrines. The coffee gardens have been made less easily accessible by a fence. For mass treatment it was desirable to expel the roundworm as well as the hookworm, as the appearance of the former ensures a more dramatic effect on the native's mind. Therefore a combination of carbon tetrachloride and chenopodium oil was administered (adult dose 3–3½ cc. of the first, with 18–20 drops of the second). Of 1,000 hookworms expelled 561 were found to be Necator, 439 Ancylostoma. The results of the campaign will only become apparent after some time.

W. J. Bais.

Chandler (Asa C.) & Mukerji (A. K.). **Combined Carbon Tetrachloride and Oil of Chenopodium in the Treatment of Hookworm Disease. A Report on the Treatment of 70 Cases.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 145–147. With 1 chart in text. [9 refs.]

Though this paper contains little that is new, it serves a useful purpose in summarizing our knowledge of the results of treatment of hookworm infection by oil of chenopodium and carbon tetrachloride. The figures and diagrams given are based upon 70 cases, none of them, however, heavily infected, treated by the combined drugs (60 mins. of the tetrachloride in milk ; oil of chenopodium, 15 mins. in capsule, followed in two hours by a saline purge) as compared with the results obtained by either of the drugs separately.

It is shown that carbon tetrachloride alone in 70 min. dose is best for pure Necator infection, while Ancylostoma succumbs more readily to the combined drugs. Untoward symptoms have been practically negligible. 3–4 cc. of carbon tetrachloride is found to be a perfectly safe dose, and this is not endangered by combination with 15 mins. of oil of chenopodium.

H. H. S.

O'Brien (Henry R.). **Successful Hookworm Control with Chenopodium—Carbon Tetrachloride.**—*Amer. Jl. Public Health.* 1925. Aug. Vol. 15. No. 8. pp. 696–699. With 3 text figs. [4 refs.]

In the campaign conducted in Siam by far the greatest number of treatments given since May, 1923, have been with a mixture composed of 40 per cent. chenopodium and 60 carbon tetrachloride. This mixture combines the efficacy of carbon tetrachloride in dealing with hookworms and the virtues of chenopodium in removing other parasites present. The dilution with carbon tetrachloride serves to lessen the discomfort of taking chenopodium as well as to reduce the cost. Chemically pure carbon tetrachloride was purchased and repurified when necessary. The maximum dosage used was 2 cc. of the mixture. The patient appeared without breakfast, and at 7 a.m. was given half a dose of the mixture. The other half was given at 8 a.m. At 9 a.m. he drank an ounce of magnesium sulphate in hot water, and was dismissed with the warning not to take food until his bowels had moved. In the case of a child of 15 years of age, or under, the dose was 2 drops for each year of apparent age, taken at one time in castor oil. Treatment was refused in cases complicated by tuberculosis, heart or kidney disease, acute conditions and pregnancy. Between May, 1923, and September, 1924, more than 225,000 individuals were treated by this routine. Only 3 deaths were reported which were, on investigation, found to have no connexion with the campaign treatment. This is a satisfactory and reassuring statement.

R. T. L.

Stevenel. **Essais de traitement des parasitoses intestinales par le tétrachlorure de carbone en capsules. (Recherches faites dans un bataillon d'Indochinois.)**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 460–464.

By tests made upon parasitized Indo-Chinese soldiers the author attempted to estimate the value of carbon tetrachloride in capsules

and the relative value of this drug and thymol in the treatment of Ascaris, hookworm, and Trichuris infections.

The mode of administration of the tetrachloride was more elaborate than is usually the case. The patients were admitted to hospital at 11 a.m., and kept on very light diet. At 4 p.m. each was given 15 gm. of sodium sulphate. The next day, at 8 a.m., the bowel was washed out with boiled water [the reason for its being boiled is not stated], and at 8.30 eight capsules were administrated, each containing 0·63 gm. of the tetrachloride, making a total of 5·04 gm., or 3·09 cc. At noon another 30 gm. of sodium or magnesium sulphate was given. At about 5 p.m. a little broth was allowed and ordinary diet was resumed on the following day.

The tetrachloride was a little more efficacious than thymol against Ascaris (68·51 per cent., as compared with 64·51) ; against hookworm 54·25, as against 45·90 per cent. ; but for Trichuris the thymol proved by far the better, namely, 43·06 per cent., as compared with carbon tetrachloride 13·79 per cent.

H. H. S.

Maciel (Heraldo). **Um anno de emprego do tetrachloreto de carbono no Hospital Central da Marinha.**—*Sciencia Medica.* 1925. Apr. 30. Vol. 3. No. 4. pp. 282–301. With 4 figs. on 2 plates. [45 refs.]

In Brazil hookworm patients are found to harbour the three types : *Ancylostoma duodenale*, *A. brasiliense* and *Necator americanus*, but the latter predominates. The first is found in some 6 per cent. of cases in the towns, due, it is said, to European immigrants ; in the rural districts it is absent. Carbon tetrachloride was first used for this infection in 1922, and the author has met with no cases of toxic effects when using Merck's " Necatorina," that is, the drug guaranteed pure, put up in gelatin capsules. Toxicity is due to impurities, in particular carbon bisulphide and carbonyl bichloride.

During 1924, 1,508 cases were treated ; 996 were given a single dose (3 cc. for adults, children in proportion), 324 required two doses and 112 three ; the interval was usually 8 days. The author confirms previous investigators as to the particular efficacy of this drug for Necator and its uselessness for Trichuris infection. Ascaris occupies an intermediate position, and when this parasite is also present the carbon tetrachloride is better combined with oil of chenopodium.

H. H. S.

Travassos (Lauro). **Tetrachloreto de carbono.**—*Sciencia Medica.* 1925. Apr. 30. Vol. 3. No. 4. pp. 279–281. With 1 text fig.

The author employs rather larger doses of carbon tetrachloride than those in general use, namely, 1 cc. for those between 3 and 7 years of age, 2 cc. between 8 and 11 years, 3 cc. between 12 and 15 years, 4–5 cc. for those over 16 years. He uses Merck's preparation, " Necatorina," in which the pure drug is enclosed in gelatin capsules. For young children who find a difficulty in swallowing capsules he gives the drug in castor oil

H. H. S.

Takagi (Otokuma), Tamaki (Shyuki), Ito (Teruhiko) & Murata (Shiro). **[On the Efficacy of Parasitol employed for the Elimination of Parasites.]** —*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. Sept. No. 343. [Summarized in *Japan Med. World.* 1925. May. 15. Vol. 5. No. 5. p. 132.]

The authors observed that "Parasitol," *i.e.*, carbon tetrachloride, gave very good results in ankylostome cases.

R. T. L.

Stenhouse (H. M.). **The Real Cause of Elephantiasis.**—*U.S. Nav. Med. Bull.* 1925. Feb. Vol. 22. No. 2. pp. 119–127. [6 refs.]

Delamare (G.) & Mouchet. **Dermite dyschromique marginée, d'origine filarienne.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 316–317. With 1 text fig.

MEDICAL ZOOLOGY.

Indian Medical Gazette. 1925. June. Vol. 60. No. 6. pp. 276–282.—**The Insect Menace.** [Fletcher (T. Bainbrigge), Sen (S. K.), Christophers (S. R.), Andrews (E. A.), Edwards (J. T.), Richards (P. B.), Howard (A.).]

There is nothing very novel in the miscellany of papers included under the above title. Fletcher emphasizes the importance of entomology to India as a country so directly dependent on husbandry. He endeavours to estimate the money-worth of the several items of damage (to crops, cattle, forests, human life and labour) done by noxious insects in India, and computes the total annual loss as equivalent to 200 crores of rupees (about £140,000,000); and he argues that if applied entomology saved even one per cent. of that estimated loss "such a saving would more than justify the most complete expansion of entomological work that we can possibly imagine." Sen and Edwards survey the subject from the veterinary standpoint. Christophers breaks away in speculations upon the possibility of specific interrelations in the geographical distribution of races of man, species of Anopheles, and species of malaria parasites. Andrews and Richards deal with insect pests of plants, Andrews speaking very much to the point on the necessity of considering the environment in which the pest finds its opportunity. Howard also speaks with discernment on natural resistance and resistant varieties of plants, and from that point of view hints at the insect pest as a possible blessing in disguise.

A. Alcock.

Mackie (F. P.). **The Insect Menace.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 172–178.

There is nothing new in this admirable and comprehensive presidential address, in the prologue of which is well emphasized the enormous mortality of the Indian population from diseases transmitted by insects, and in the epilogue the necessity of a closer co-operation of the Medical Research Department and the Public Health Service.

A. A.

Hegner (R. W.). **Medical Zoology and Human Welfare.**—Reprinted from *Science.* 1924. Dec. 19. Vol. 60. No. 1564. pp. 551–558.

In most lucid terms the lecturer unfolds the scope and bearing of pure science, as illustrated in one direction by the wondrous tale of the malaria parasites, the yellow fever mosquito, the Clonorchis, and the Japanese Schistosoma, in another direction by the weird story of the malaria treatment of general paralysis, and in still another direction by visions of untold tropical spaces purged and prepared for the increase of hygienically-minded mankind by the extermination of parasitic animals and their allies. Thoughtful and artistic revelations of this kind are a persuasive contrast to the rather lurid dumb-show of the cinematograph.

A. A.

LAMBORN (W. A.). **The Seasonal Habit of the Common Anophelines of Nyasaland, with a Note on its Relation to the Seasonal Incidence of Malaria.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 361–376. With 1 chart in text. [9 refs.]

The author's observations extended over two years, at Fort Johnston, in lat. 14° 27′ S., just south of L. Nyasa. Systematic collections of mosquitoes were made, on alternate days, three times every week; the collections made in 1923 amounted to 11,829, of which 10,418 were Anophelines, chiefly *A. costalis* and *A. funestus*, with 13 *A. mauritianus*; the total for 1924 was 20,689, of which 14,706 were Anophelines. In addition, breeding-places were visited at regular intervals.

A. costalis was observed to have a very distinct seasonal prevalence, being essentially a breeder in small pools—hollows, borrow-pits, hoof-prints, depressions by the road-side—and therefore very abundant during the rainy season and scarce in the dry season, its season of prevalence being coincident with the season of epidemic malaria. From the facts observed the author concludes that its control should be a comparatively simple matter.

In the case of *A. funestus* no such seasonal prevalence was observed; though the author emphasizes the necessity of care in applying his observations to other localities without actual study there.

A. A.

BRUG (S. L.). **De geographische verbreiding der muskieten in Nederlandsch Oost-Indië.** [The Geographical Distribution of the Mosquitoes in the Dutch East Indies.]—*Geneesk. Tijdschr. v. Nederl. Indië.* 1925. Vol. 65. No. 1. pp. 1–8. [10 refs.]

The distribution of the Australian and the Oriental species of anopheline and culicine mosquitoes in the Dutch East Indies was studied by the author. He compiles his results in tabular form and finds no definite borderline between the two regional groups. Oriental species prevail. On the major Sunda Islands no Australian species were met with; there are few on the minor Sunda Islands, more on the Moluccas, but only New Guinea shows the Australian type from this zoögeographical point of view.

W. J. Bais.

STRICKLAND (C.). **The Mosquito Factor in the Malaria of Assam and its Prevention.**—*Proc. Assam Branch, Brit. Med. Assoc. Ann. Meeting Jorhat, 2nd Mar. 1925.* pp. 30–42.

There is in this paper nothing new in fact or principle, but nevertheless it is a valuable document, since it emphasizes and illustrates, throughout, the doctrine that methods of mosquito-control must be adapted with a nice discrimination of the several habitats of local species, if they are to be effective in the local prevention of malaria. After a few telling introductory remarks on the futility of haphazard efforts, the author singles out for particular attention 5 species of Anopheles—*umbrosus*, *culicifacies*, *funestus* (=*minimus* and *listoni*), *aconitus*, and *maculatus*—which he appears to think most dangerous

in Assam, describing the characters of the breeding-places of each so that the appropriate measures of control may be applied. The principles of control are then considered individually—first, those that can be put in force without particular study, and then those that are useful and economical if employed with full intelligence, but may be unnecessarily expensive and even downright dangerous if adopted blindly : among the first are screening, keeping water-courses of all kinds clean and tidy, and filling ; among the second—which can be applied only with full knowledge of the habits of the particular species aimed at—drainage, oiling, flooding (*i.e.*, converting a marsh or a confluence of streams into a lake by damming), alternative clearing or retaining jungle, and restriction of rice cultivation. Remarks on such matters as quinine prophylaxis, consultation of an experienced medical officer in selecting sites, finance, education, and that hateful subject "propaganda," conclude an essay which all planters' doctors in Assam will find very useful.

A. A.

Root (Francis M.). **American Anopheline Mosquitoes, their Classification and their Relation to the Transmission of Malaria.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 149–155. [United Fruit Company, Boston, Mass.]

Cp. *Bulletin*, Vol. 20, p. 458. In the author's present summary *A. quadrimaculatus, maculipennis, albimanus, tarsimaculatus,* and *argyritarsis* are listed as the most important malaria-carriers known ; *A. crucians, punctipennis, pseudopunctipennis, grabhamii, pseudomaculipes, intermedius, mediopunctatus,* and *bellator* as of subordinate importance ; and *A. nimbus, lutzi, parvus,* and *braziliensis* as suspects on epidemiological grounds. H. R. Carter, however, gave evidence of *punctipennis* being the sole species present in two places where malaria was endemic, and of being the greatly prevalent and solely responsible species in another place where there had been a considerable epidemic of malaria ; and also as to *crucians* being the only species found breeding in a considerable part of the decidedly malarious tide-water section of Virginia.

A. A.

Kligler (I. J.) & Theodor (O.). **Effect of Salt Concentration and Reaction on the Development of *Anopheles* Larvae.**—*Bull. Entom. Res.* 1925. July. Vol. 16. Pt. 1. pp. 45–49. [8 refs.]

The authors observe that *Anopheles multicolor* breeds in sea water and in salt water having a salinity of as much as 4 per cent., and they refer to other species of Anopheles which other observers have noticed breeding in sea water or in water of considerable salinity—*A. costalis, A. rossi, A. quadrimaculatus, A. crucians, A. albimanus* [which does not exhaust the list]. They, therefore, experimented with eggs and larvae of *A. elutus, sergenti,* and *superpictus,* and here record their observations. [They seem to have ignored all the observations that have been recorded regarding the very considerable elasticity of adaptation of aquatic animals of all kinds to changes and fluctuations in their medium—of marine forms locally adapted to fresh water, and

fresh water forms to sea water. These phenomena have interested many zoologists in the tropics, and the exhaustive survey of the Chilka Lake made by ANNANDALE, and published serially in the *Memoirs of the Indian Museum* is particularly worthy of mention.]

A. A.

NECHELES (Heinrich). **Zur Sinnesphysiologie von Anopheles.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. June 1. Vol. 29. No. 6. pp. 288–291. [2 refs.]

The title of this paper is a little bit misleading. The author's observations, made both in open and in experimental conditions, show that Anopheles (species not named) is influenced more by the moisture of the atmosphere than by heat and light. An atmospheric moisture of 75 to 80 per cent. is the optimum. A starving Anopheles will come into the light or will even rest in the sun if the moisture is suitable. Wintering Anopheles are attracted to cellars, and if the " biological moisture " is suitable they live ; but if it is not, they die. The author thinks that the hairs of Anopheles are hygrometers, so to speak, and operate upon nerve end-organs. He would have preferred to continue and extend his observations before publishing, but appears to have been influenced by the fact that he was working with a grant-in-aid.

A. A.

CHARRIER (H.). **Action des huiles et du pétrole sur les larves de moustiques.**—*C.R. Soc. Biol.* 1925. May 15. Vol. 92. No. 16. pp. 1280–1281.

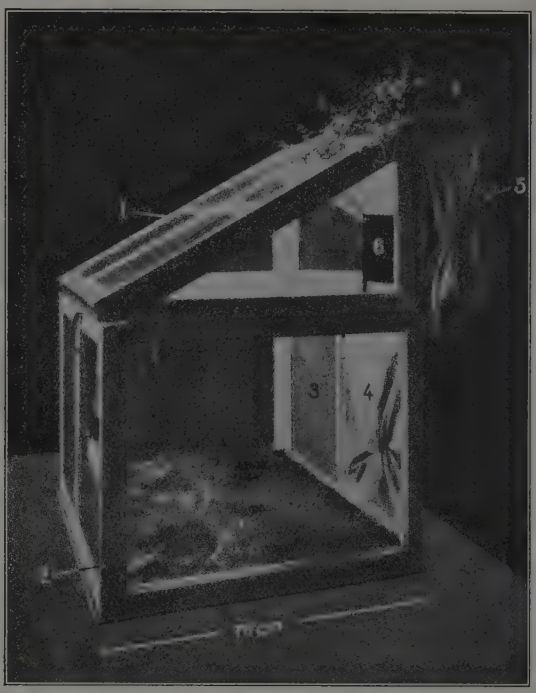
The author's experiments confirm the facts, well known to many, though often obscured by popular error, that oil, as plain oil, kills mosquito larvae by suffocation ; that heavy petroleum kills them mainly by its toxic properties, suffocation being quite subsidiary ; and that refined petroleum acts upon them purely as a toxin.

A. A.

MARTINI (E.). **Ueber Anopheles-Zucht (mit einigen Anopheles-Beobachtungen).**—*Cent. f. Bakt.* 1. Abt. Orig. 1925. May 1. Vol. 94. No. 7/8. pp. 452–460. With 3 text figs.

Martini complains that English writers generally are insufficiently acquainted with the authoritative literature of their subjects ; for instance, in describing recently their success in rearing several generations of Anopheles in captivity, certain English writers appear to have overlooked the fact that EYSELL, in 1912, and he himself, before that, succeeded in getting eggs from *Anopheles plumbeus* (=*nigripes*) reared in captivity. He gives a minute description and figures of his breeding-cages. The principles, of course, are to have the cages large enough to give freedom of flight, and furnished as naturally as possible with a large tray of growing grass and bowls of water and water-weed amid the grass ; and he provides them with a " sleeping-room " projecting from the upper part of one side ; the atmosphere of the cage obtains its indispensable moisture from the growing grass,

etc., in the bottom of the cage, but the atmosphere of the " sleeping-room " must also be kept in condition, by means of a zinc roof on the



Cage for continuous breeding of Anopheles. The special " sleeping room " and growing plants on its roof are shown at (5).

[Reproduced from the *Centralblatt für Bakteriologie.*]

outside of which are placed some pots of creeping plants. One side of the " sleeping-room," and part of one side of the main cage are of gauze with the usual sleeve.

A. A.

Marchoux (E.). **Modes divers d'hibernation de l'***Anopheles maculipennis.* —*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 405–407.

The author states, of *Anopheles maculipennis,* that in February he was unable to find any adults in Algeria, and that in April he could find only two in Corsica. He states also that Grassi and Bini could not find any in the winter at Fiumicino. In Corsica, however, in winter, he found young larvae. He is, therefore, of opinion that this species hibernates in the egg and the larva stages as well as in the female adult stage.

A. A.

Falleroni (D.). [**Studio sugli "*Anopheli maculipennis*" delle Palludi Pontine.** 1924. Aug. 12. 43 pp. Recanati, Typographie Economique.).]—[Summarized in *Bull. Inst. Pasteur.* 1925. Jan. 15. Vol. 23. No. 2. pp. 87–89.]

Results of observations, continued for a year, at the anti-malaria station of Casale in the Pontine Marshes (between Rome and Naples), of the local species of Anopheles, but particularly of *A. maculipennis*. The author insists upon the necessity of an exhaustive study of these mosquitoes, and emphasizes the view that anti-malarial sanitation is an agricultural and economic question—the protection afforded by farmyard animals being the most important part of the agricultural aspect. In many marshy places these sanitary results of good farming can be obtained without any pretentious drainage schemes, the author thinks. The biology of *A. maculipennis* is treated in much detail.

A. A.

Carter (Henry F.). **The Anopheline Mosquitoes of Ceylon. Part I. The Differential Characters of the Adults and Larvae.**—*Ceylon Jl. Sci.* (Section D. Med. Sci.). 1925. Apr. 27. Vol. 1. Pt. 2. pp. 57–97. With 7 plates & 11 text figs. [29 refs.]

This is the first of a series of articles dealing with the natural history and pathological significance of the several species of Anopheles of Ceylon. In this instalment the 18 known species (and varieties) are described succinctly and with proper emphasis of their specifically discriminative characters, both in the adult and in the larval phase. In addition there is a brief and pointed description of the superficial anatomy of the adult and the larva of the anopheline type, as a guide to the novice; and there are some excellent figures. As a whole this descriptive entomological instalment is exactly suited to the requirements of the medical officer, being full and critical yet concise and simple in method.

A. A.

Russell (Paul F.). **Identification of the Larvae of the Three Common Anopheline Mosquitoes of the Southern United States.**—*Amer. Jl. Hyg.* 1925. Mar. Vol. 5. No. 2. pp. 149–174. With 5 figs. [42 refs.]

The three species are *A. crucians*, *A. punctipennis*, and *A. quadrimaculatus*. The first is distinguished from the other two by having on the dorsal surface of the 4th and 5th abdominal segments two tufts of hairs in line advance of either palmate scale. The second is distinguished from the third by having the internal clypeal hairs placed remarkably close together.

There is a useful bibliography on the subject of anopheline larval characters.

A. A.

i. Strickland (C.). **On the Larvae of some Indian** *Anopheles*.—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 561–563. With 2 plates. [2 refs.]

ii. Necheles (H.). **A Contribution to the Physiology of Anopheles.**—*Harefuah.* Jerusalem. 1925. Apr. Vol. 1. No. 4–5. English summary p. III. [In Yiddish pp. 171–173.]

iii. Theodor (Oscar). **Observations on Palestinian** *Anopheles*.—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 377–382. With 3 text figs. [5 refs.]

iv. Brumpt (E.). **Les anophèles de Corse.**—*Bull. Acad. Méd.* 1925. July 21. Year 89. 3rd Ser. Vol. 94. No. 29. pp. 811–815.

v. Christophers, (S. R.). **Provisional List and Reference Catalogue of the Anophelini. Part I.—Provisional List of Species. Part II.—Descriptive Synopsis.**—*Indian Med. Res. Memoirs. Supplementary Series to Indian Jl. Med. Res.* 1924. Dec. Memoir No. 3. 105 pp.

vi. Dyar (H. G.). [**Note on Bromelicolous** *Anopheles* **(Diptera, Culicidae).**—*Insecutor Inscitiae Menstruus.* Washington, D.C. 1925. Apr. 15. Vol. 13. No. 1–3. pp. 25–27. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 91.]

vii. ——. [**Some Mosquitoes from Ecuador (Diptera, Culicidae).**]—*Insecutor Inscitiae Menstruus.* Washington, D.C. 1925. Apr. 15. Vol. 13. No. 1–3. pp. 27–31. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 91.]

viii. Sinton (J. A.) & Little (C. J. Harwood). **The Occurrence of** *Culicoides* **as an Ectoparasite of Anophelines.**—*Jl. Roy. Army Med. Corps.* 1925. July. Vol. 45. No. 1. pp. 45–47. [10 refs.]

i. The writer describes some diagnostic features of the larvae of *Anopheles lindesaii, gigas,* and *fuliginosus,* and figures some of them. He notes also that the larvae of *A. maculatus* and "*willmori*" are identical.

ii. The vital importance for Anopheles of atmospheric moisture is emphasized. "The distribution of Anopheles in a room depends on the relative moisture." The author thinks that even the hairs of the insect are sensitive to moisture.

iii. The following items may be noticed. The eggs of *Anopheles elutus* possess air-floats during autumn and winter. It is difficult, if not impossible, to distinguish between the pupae of the Myzomyia section, so variable are the supposed distinctions.

iv. The author notes of the pathogenetic species of Anopheles of Corsica that they are attracted by domestic animals—a fact "that has a great interest from the standpoint of malaria prophylaxis." His observations are here recorded in detail.

v. A useful catalogue: it includes 124 species regarded by the author as valid, and 42 varieties "such as may be supposed to be species in the making." The species are conveniently characterized in a synoptic table, apart from the synonymy.

vi. Neotropical Anopheles known to breed in Bromeliaceae are *A. cruzi* (with race *neiwai*) and *A. bellator* (with race *bromelicola*).

vii. These mosquitoes from Ecuador include *Anopheles tarsimaculatus, pseudopunctipennis,* and *mediopunctatus.*

viii. This short paper includes a new instance, and a brief retrospect of previously recorded instances, of Culicoides observed feeding upon a replete Anopheles, and conjectures as to the possibility of a Culicoides becoming infected from a malariated Anopheles.

A. A.

Sinton (J. A.). **Notes on some Indian Species of the Genus Phlebotomus. Part X. Abnormalities in the Appendages of some Specimens of** *Phlebotomus.* **Part XI. The Rôle of Insects of the Genus** *Phlebotomus* **as Carriers of Disease, with Special Reference to India. Part XII.** *Phlebotomus argentipes* **Annandale and Brunetti, 1908.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 467–470. With 1 plate. [3 refs.]; Apr. No. 4. pp. 701–729. [101 refs.]; pp. 789–800. With 8 figs. on 1 plate. [20 refs.]

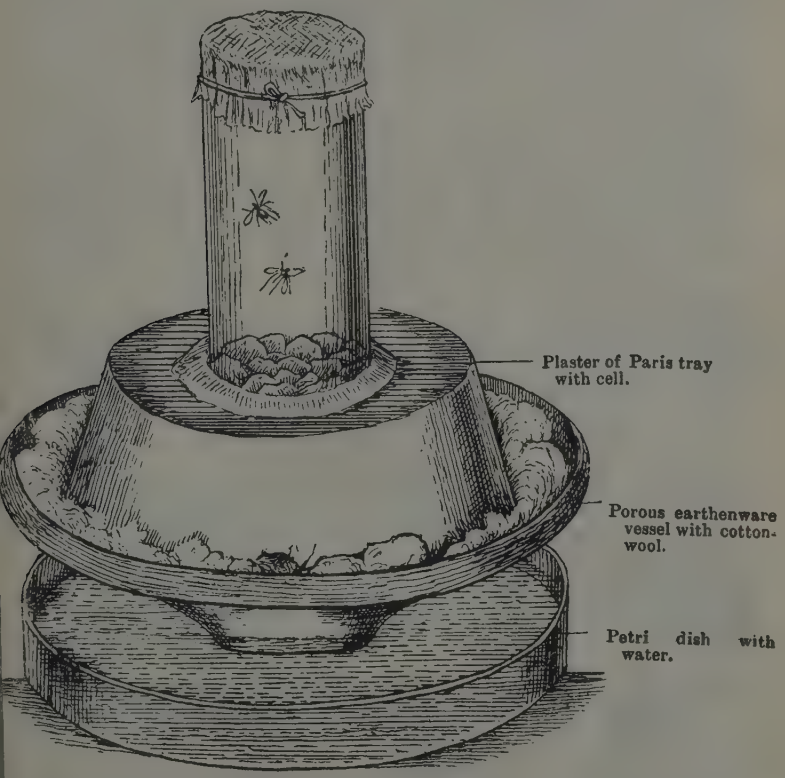
X. Notes of individual abnormalities of wing, antennae, palpi, and male genitalia in species of Phlebotomus.

XI. A comprehensive and minutely particular survey of the pathogenetic history of Phlebotomus in respect of phlebotomus fever, Oriental sore, and kala azar, as occurring in India.

XII. The author here states that the species described and figured by him as *Phlebotomus annandalei* (*Ind. Journ. Med. Res.*, Vol. 10, 1923, pp. 742–753, pl. 42) is identical with *P. argentipes* Annandale & Brunetti (1908), and he now adds some further minutely descriptive particulars of *P. argentipes* (=*annandalei*), and some details of its distribution, which does not extend beyond India and Ceylon, so far as is known at present.

The diagnostic characters of this important species are here emphasized, and the reader is referred to the anatomical figures of *P. annandalei* in plate 42 of the paper cited above.

A. A.



Apparatus for breeding sandflies, showing cell prepared for oviposition.—

[Smith (R. O. A.)].

[Reproduced from the *Indian Journal of Medical Research.*]

Smith (R. O. A.). **A Note on a Simple Method of Breeding Sandflies.** —*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 741–742. With 4 figs. on 2 plates. [1 ref.]

The following is the main part of the author's description of the method :—

"Fed females, which in almost every instance were fecundated, were secured and kept in glass tubes, till such time as all the blood in the mid-gut was digested, and the abdomen of the fly showed white, full and distended. This usually took two to three days. These flies were then transferred to another tube set on a plaster of Paris cell, in which were placed a few small stones and some crushed rabbit's faeces. The glass tube in which the flies were enclosed was only slightly larger than the hollow in the plaster cell. The cell was then placed on a rough earthenware vessel with a layer of damp cotton-wool between the plaster and the earthenware vessel. The whole apparatus was then stood in a Petri dish of water. The result of this was that moisture was drawn up through the earthenware vessel and cotton-wool to the plaster of Paris cell in just the requisite amount to favour oviposition. Since the flies had not much range of flight and choice of position, eggs laid were always found on the sides of the hollow in the plaster cell. In this position they could be left till the larvae emerged and made their way to the rabbit's faeces to feed. This method obviated the necessity of collecting the ova and placing them in another tray.

"If the material in the cell was too moist, the larvae would all be found on top, avoiding the deeper and damper layers.

"As soon as the larvae emerged, which usually occurred in about 4–7 days, the glass tube from the top of the tray was removed and a second earthenware vessel used to cover the plaster cell, for the larvae grew and thrived better in the dark. This is probably the reason why sandfly larvae are so difficult to find, as they prefer dark corners.

"As the larvae grow they require less and less moisture, till—during pupation—practically no water is required.

"Pupation took place in 12 to 14 days, and the stage of pupation usually lasted 5 to 10 days. As soon as pupation took place, the upper earthenware vessel was removed and the chimney of a hurricane lamp substituted. A piece of thin muslin was used to cover one end and the other was fixed to the plaster tray by plasticine." A. A.

Adler (S.). **Parasites of** *Phlebotomus papatasii.*—*Harefuah.* Jerusalem. 1925. Apr. Vol. 1. No. 4–5. English summary pp. IX–X. [In Yiddish pp. 211–217. With 33 text figs. [8 refs.]]

In catches of Phlebotomus in Jericho, in October-December, *P. papatasii* greatly predominated over *P. minutus* and *perniciosus*. Mites were found on one specimen and *Herpetomonas papatasii* in three others. A. A.

Bequaert (J.). **Report of an Entomological Trip to the Truxillo Division, Honduras, to investigate the Sand-Fly Problem.**—*Thirteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1924. pp. 193–206. With 1 fig. [8 refs.]

A discursive account of a field excursion. Psychodidae were observed, but the sand-flies specifically mentioned in the title were not Phlebotomus, but two troublesome species of Culicoides. [Psychodidae, of course, have no prescriptive claim to the name "sandflies"—a name which has commonly included Culicoides and even Simulium.] A. A.

Mercier (L.). **Diptères "buveurs de sang" et diptères "suceurs de sueur." Leur association possible dans la propagation de certaines maladies d'origine microbienne.**—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 135–136. [2 refs.]

The author verifies the familiar fact that certain very common flies—Hydrotaea, Morellia, and some species of Musca—are particularly troublesome to cattle [and man], not by sucking blood directly, but by persistently sucking sweat and other secretions, and perhaps sometimes taking the blood exuding from a wound made by a true blood-sucking fly. He speculates on the pathogenic possibilities of such suckers of sweat, but does not seem to have observed whether any of them possess—as do Hydrotaea, Lispa, and Scatophaga—formidable labellar teeth.

A. A.

Fiji. **Annual Medical Report for 1921. Memorandum by the Government Entomologist.** [Simmonds (Hubert W.).]—3 pp. [MS. received from the Colonial Office.]

Illingworth attributed a disappearance of house-flies (*Musca domestica*) from most parts of Fiji, in "about 1912," to a species of ant, which he observed carrying off the eggs and small larvae. Further observations by the present Government Entomologist (H. W. Simmonds) confirm the statement that the ant, now identified as *Pheidole megacephala*, is a very active agent in controlling the house-fly in Fiji, and that it works both in the stables and in the paddocks.

A. A.

Muzzarelli (Erminio). **Sul passaggio di alcuni microrganismi patogeni attraverso lo intestino delle mosche carnarie.**—*Ann. d'Igiene.* 1925. Mar. Vol. 35. No. 3. pp. 219–228. [7 refs.]

The object of the experiments detailed in this paper was to find out whether organisms ingested by fly larvae were still viable after passing through the intestine, whether those ingested in the larval stage persisted in the imago, and, finally, whether, if this were so, the organisms might be transmitted to the succeeding generation. The author first determined the microbial flora of the larval intestine and then allowed the larvae to feed on meat plentifully strewn with certain bacteria, such as *B. pyocyaneus*, an acid-fast streptothrix, a pathogenic blastomycete, etc. He found that pathogenic organisms lose their pathogenicity by such passage, and that organisms, when ingested by the larvae, do not persist to the adult stage. The third point, therefore, did not arise.

H. Harold Scott.

Strickland (C.) & Roy (D. N.). **The Infection of *Lucilia caesar* with *Herpetomonas*.**—*Parasitology.* 1925. May. Vol. 17. No. 2. pp. 168–169.

The authors conclude that the flies do not transmit their infection of Herpetomonas to the ovum. Larvae are easily infected from food contaminated by parents. An infection acquired by the larva is largely or

completely lost in the course of attaining the adult stage. Adult flies easily acquire infection whether or not the larvae has been infected. Outside the body of the fly the Herpetomonas can survive at least 18 days.

A. A.

SWYNNERTON (C. F. M.). **An Experiment in Control of Tsetse-Flies at Shinyanga, Tanganyika Territory.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 313–337. With 14 figs on 7 plates, & 1 map.

The author of this paper is one of those who, having lived in the jungle and thought about the jungle, has come to realize that in any great zoogeographical province the whole living creation—animal and vegetable and man himself included—is mutually bound together by intricately-intersecting natural ties of dependence, or, one might almost say, of commensalism ; so that if at any point the nexus galls him, man must get ease, not by trying to cut the knot, which only makes things worse for him, but by carefully studying the organic environment.

The following items from the summary of the author's observations for the control of tsetse-flies at Shinyanga in Tanganyika Territory are of general interest :—

" Shinyanga is divisible into : (*a*) Thorn-bush country containing plenty of tsetse, but no population . . . (*b*) Open grass-land, produced in the past from the thorn bush by the settlement in it of people in sufficient numbers to clear it and keep it clear through their cutting for firewood and building and the browsing of their stock.

" Except in one respect the position in the open country is ideal. There is complete segregation of tsetse and people, and a situation exists in consequence amounting, for practical purposes, to control of the tsetse. . .

" The exception is this. The tree roots still survive in the open country and, whenever population thins for a time, shoot up into bushes and trees. Where these are adjacent to tsetse bush, the fly is carried into them, while they are still small, on persons passing to and fro, and cattle begin to die. The people then fall back, allowing new bush to spring up and the process to be repeated. This retreat and the reconquest by fly has been for some time at the rate of a mile a year, and new " fronts " have been formed, so that the cattle-areas are now nearly surrounded.

* * * * *

" The remedy is in the hands of the people themselves. They have merely each year to combine to cut back the young shoots and the bush and the tsetse cannot advance. And persons must not allow the flies to travel on them into cleared areas.

" But the retreat, and natural increase of stock, have caused congestion of the cattle in the areas still populated, with severe shortage of grazing, and deaths ; and the destruction of grass has led to erosion and serious loss of soil. The remedy is again easy. When the people come out each year to cut back the young shoots, they should take the opportunity to clear for some little distance into the bush and so get enough grazing. Also, any new agriculture likely to demand much ground, and so still further to reduce the grazing, should be located so far as possible in the fly-bush . .

* * * * *

" A small, typical, infested block of the fly-bush has been cut off by clearing and an experiment initiated : (*a*) In inducing natives to settle in the barrier, so as to widen it automatically and keep it clear ; (*b*) in clearing the block itself of fly ; and (*c*) in testing the width of barrier which, combined with such precautions as may prove of use, will prevent the block from becoming reinfested from the main bush. The initial response to the inducements offered has been good.

"The first step towards breaking up the fly-belt on a greater scale has been taken by clearing, to a width of 400 yards on either side, a road traversing a point at which the fly-belt narrows to seven miles. It is planned to make (and greatly widen) further breaks, and to attack in detail the blocks broken off, should it prove difficult otherwise to prevent reinfestation of country that may be cleared of fly by grass-burning etc.

"Felled bush continued to harbour fly for some time, at any rate, if people and game continued to wander between it and the bush as yet unfelled. Complete destruction of the timber by twice piling and burning it made it uninhabitable by fly, but if time is of no account, the bush can lie till the twigs and small branches of it are warped downwards into a closer mass by the next rains, and so are destroyed by the grass fires of the following year.

"A direct prohibition, enforced by a patrolling guard here and there, reduced nearly to nothing the carrying of flies into cleared or cattle country by man. Game wandered in and out almost entirely at night. The stationing of a pair of fly-boys on a road with nets, combined ultimately with dark shelters alongside for the attraction of the flies, was most useful during an entire year in preventing the carrying in of flies by cars and wayfarers. The attachment of brown paper smeared with "rat varnish" to the hoods of cars and the backs of natives was useful in destroying flies frequenting a road.

"Mere cutting of tsetse bush is useless, for it springs again, so that it is futile to try to gain ground by this means faster than we can consolidate it. The following measures for the consolidation of clearing are being tested now in Shinyanga: The introduction of native settlement to keep the ground clear automatically; the special cutting down once or twice a year by each village of the new shoots for a few hundred yards round; the encouragement of the keeping of goats; the diversion of large scale agriculture by ploughing, which entails stumping, to the clearings it is wished to consolidate; the digging up of stumps by the natives for firewood; and the killing of trees by poisons and particular forms of ring-barking.

"The annual postponement of the grass fires till October, and then lighting them on an organised plan . . . In 1921, I carried out a successful experiment near Kilosa. Father Cirvegna took up the organisation of the measure over a small piece of fly-belt at Madibira, in the Iringa district, and there seems to be little doubt that he has cleared the area of fly by means of it in three burnings.

"A large scale experiment by myself this year in the Nzega and Shinyanga sub-districts seemed to show: (*a*) That by means of native guards, each with an area, and some aid from the headmen, it is perfectly possible to preserve a great piece of country nearly unburned; (*b*) that the late grass fire, lighted on a broad front with a good wind and followed up by the burners, produces, when the grass growth is sufficient, a "drive" of the flies on the wing; these then become congregated in enormous numbers beyond the limits of the fire and in any appreciable patches of ground which escape it; (*c*) that in these places, by the prompt use of nets and bird-lime, it is possible nearly to exterminate the congregated flies . . . (*d*) that far more numerous breeding thickets and breeding logs are destroyed by such a fire than by an earlier or ill-organised fire, and that with the expenditure of some labour in the littering with dry grass of thickets and logs unlikely to be burned otherwise all may be burned, or many may be cleared by hand; (*e*) that a much larger percentage of dead pupae (52 per cent. in this case) may be found afterwards in breeding places thus burned through than in those that are not burned (9 per cent.).

"Some of these indications merely confirm results previously obtained by me in Rhodesia and Tanganyika; others need to be confirmed by means of further experimentation. Meantime, combined with Cirvegna's result, they suggest that late organised grass burning is likely to be of value over the very considerable areas in Africa in which the grass and the dry season

are long and organisation is possible. But even if this should definitely prove true, means of preventing reinfestation must be studied, for these may turn out to be a serious difficulty.

"The relations of the fly and the game are not being ignored . . .

"This scheme amounts to an attempt to destroy and control tsetse by means of agencies and resources already in existence and merely requiring to be diverted specially to that purpose and organised, and by enlisting the co-operation of the people themselves who are to be aided and protected. This is both the most practical way of dealing with the problem and the way that best accords with the sound policy of educating the natives to understand and attack their own problems and advance themselves through their own efforts."

A. A.

SWYNNERTON (C. F. M.). **The Tsetse-Fly Problem in the Nzega Sub-District, Tanganyika Territory.**—*Bull. Entom. Res.* 1925. July. Vol. 16. Pt. 1. pp. 99–109. With 6 figs. on 3 plates.

The district in question—an illustrative one—contains: (1) "Old" savannah forest (mostly Brachystegia); (2) "younger" savannah, which appears to be cleared land that has gone back to jungle as the result of depopulation from inter-tribal war; (3) open uninhabited "grassy steppe"; and (4) open settled land. The "old" savannah is inhabited by *Glossina morsitans* and *swynnertoni*, which are advancing through the "younger" savannah and threatening the settlements. To meet the threat the author advocates properly planned and supervised late burning. This regularized burning would replace the promiscuous grass fires immemorially practised, which only lead to the subsequent spread of thicket that encroaches on pastures and shelters tsetse and eventually is extremely difficult to clear. The tracts, carefully chosen and burnt late in the season by someone who understands the business and is not distracted by other duties, would be stocked with a view to future settlement. The author's experience is against attempting to exterminate game, mainly on the ground that it diverts the population from the settled husbandry that checks the spread of tsetse, to hunting, which drives the game to and fro between fly-infested and fly-free tracts, and tends to spread the tsetse.

A. A.

GOLD COAST. i. **Report of a Brief Visit made to a Tsetse Area to obtain some Idea as to the Setting up of a Camp to Investigate Tsetse Flies as has recently been done in Nigeria.** [YOUNG (W. A.), Act. Director Med. Res. Inst., Accra.]—5 pp. F. cap.

ii. **Second Report on Tsetse Fly and Trypanosomiasis (in Response to Secretary of State's Despatch No. 630, 1923).** [YOUNG (W. A.), Director, Med. Res. Inst., Accra.]—6 pp. F. cap. [Unpublished Reports enclosed in Despatches No. 359 dated 1st May, 1924, & No. 110 dated 19th Feb., 1925, from the Governor of the Gold Coast to the Secretary of State. Received from the Colonial Office.]

These two reports give the results of two expeditions to the tsetse-fly country of northern and north-western Ashanti. The first expedition was made at the end of the dry season just at the onset of the early rains; the other at the end of the rainy season. In the course of the first (dry season) expedition, tsetse-flies (*palpalis*, *tachinoides*, and

longipalpis) were certainly observed in the places indicated on the existing spot maps, but they were everywhere very scanty, and, although the writer and his companion were once bitten (by *palpalis*, and in the darkness, before even the peep of dawn), they could bathe in the Volta river without being touched. A few flies were dissected, but they did not contain trypanosomes. Cattle and horses and donkeys were seen, and the natives, although they knew the tsetse-fly, knew nothing about sleeping sickness.

The contrast at the time of the second (end of rainy season) expedition was remarkable. *Glossina palpalis* was common on every stream and in some places very plentiful. *G. medicorum* was also found as well as *tachinoides* and *longipalpis*. Pupae of *tachinoides* were discovered, and (once only) of *palpalis*. Many flies were dissected; infection with *Trypanosoma congolense* was several times observed, and one *palpalis* was "potentially infected" with *T. gambiense*—*i.e.*, freshly imbibed blood containing that species was found in its gut. Trypanosomiasis was definitely observed by blood examination among the natives, but in only two of the cases did the patients show any symptoms of illness. The conclusions of the second report are that sleeping sickness is by no means a rare disease in Ashanti, but it is undoubtedly chronic, and probably many spontaneous recoveries take place.*

A. A.

Porter (Annie). **Notes on some Insect Larvae that may occur in Man in South Africa.**—Reprinted from *S. African Jl. Sci.* 1924. Nov. Vol. 21. pp. 373–377. With 8 text figs.

Notes on cases of myiasis observed by the author in S. Africa. They include the finding of about 200 maggots of *Sarcophaga magnifica* in an old wound; of 3 maggots of another species of Sarcophaga in the nasal cavity; of maggots of *Calliphora croceipalpis* in one case in the ear, and in another case in a fresh-passed stool; of maggots of *Stomoxys calcitrans* in the neglected foot of a stable-boy; and of maggots of *Musca domestica* in fresh-passed stools on several occasions, and in one instance in a sore in a neglected child. In the last case the patient was a white child; in all the other cases the patients seem to have been natives. The occurrence of *Cordylobia anthropophaga* in S. Africa is also mentioned.

A. A.

Patton (W. S.) & Cookson (H. A.). **Cutaneous Myiasis in Man caused by *Musca domestica*.**—*Lancet.* 1925. June 20. p. 1291. With 1 text fig.

In this case—a patient of over 80 years—the maggots were those of the common housefly and although they caused some inflammation and thickening and abrasion of the skin, they did not cause much discomfort or any extensive destruction. They were observed at first emerging from a small hole or ulcer near the ankle and they continued to emerge at intervals for about six months.

A. A.

* Dr. Wade, who reported in 1911 on Kinghorn's Ashanti cases (Western Province) about a year after his visit found that of the 97, 41 were dead, 9 still ill, 29 in good health, and 10 not traceable. The percentage of deaths is high. [*Sleeping Sickness Bulletin*, Vol. 4, pp. 128–9.]—A. G. B.

Ribadeau-Dumas (L.) & Larrousse. **Myiase cutanée.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. May 21. Year 41. 3rd Ser. Vol. 49. No. 17. pp. 750–756. With 1 text fig. [13 refs.]

This paper, which does not contain anything new, is based on a case of *Hypoderma bovis* myiasis, exhibiting the usual puzzling symptoms, in a little girl. It began with pain and stiffness, followed by swelling, in the nape, and then during the following two months swellings appeared successively on the chin, face, brow, and scalp, until finally a painless swelling about the size of a walnut formed on the sinciput; in the course of a week this opened, emitting a sero-purulent liquid, and disclosed a larva at the orifice. It appeared that the child had been living at a farm about four months before the trouble began.

A. A.

Herms (W. B.). **A Case of Human Myiasis caused by the Ox-Warble, *Hypoderma bovis* de G.**—*Jl. Parasit.* 1925. Mar. Vol. 11. No. 3. pp. 149–150. [2 refs.]

Case of infestation with larvae of *Hypoderma bovis*. The patient, a cowboy, was accidentally exposed during sleep. A few days later pain and swelling occurred in the right groin and crept about extensively over the body until it became localized in the shoulder; and from this localized swelling, about 4 months after the original exposure, a larva was forced out in the course of some muscular exertion. About six months after this another hernia-like swelling occurred in the right thigh, and from this a second larva emerged in circumstances which permitted its specific identification.

A. A.

André (Émile). **Sur un cas de myiase cutanée chez l'homme.**—*Parasitology.* 1925. May. Vol. 17. No. 2. pp. 173–175. With 3 text figs. [6 refs.]

Description and figure of a young larva identified as *Hypoderma bovis*, taken from a child. The larva had penetrated the skin behind the ear and had continued its development there, without wandering.

A. A.

Lanford (J. A.) & Warner (C. M.). **Human Myiasis due to Ox Bot Fly Larvae (*Hypoderma lineata*).**—*New Orleans Med. & Surg. Jl.* 1925. May. Vol. 77. No. 11. pp. 473–474. [3 refs.]

The patient in this case was a white child of 22 months, having a slight swelling of a testicle which, after four months' duration, suddenly became increased and acutely tender. Three larvae of *Hypoderma lineatum* were found in the tunica vaginalis.

A. A.

Irvine (A. C.). **Intestinal Myiasis.**—*Kenya Med. Jl.* 1925. May. Vol. 2. No. 2. p. 51.

Case of a native teacher of 24 years who on several occasions during a term of 4 months passed maggots of a species of Sarcophaga (which the author identified as *carnaria*) and also stated that he used to pass maggots in his stools when he was a small boy. The author does not state that the case was specially investigated under hospital conditions, and indeed, he appears to be aware that the evidence here reported is not strong enough to support any particular one of several theories of causation that might be suggested.

A. A.

i. Frison (Theodore H.). **Intestinal Myasis and the Common House-Fly (*Musca domestica* Linn).** [Abstract.]—*Jl. Econom. Entom.* 1925. Apr. Vol. 18. No. 2. pp. 334–335.

ii. Newstead (R.) & Potts (W. H.). **Some Characteristics of the First Stage Larva of *Dermatobia hominis* Gmelin.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 247–260. With 2 plates. [20 refs.]

iii. van Thiel (P. H.). **Over het voorkomen van de larve van *Dermatobia hominis* L. bij den jaguar.**—*Herinneringsbundel Inst. v. Trop. Geneesk Leiden.* 1924. pp. 138–152. With 2 figs. on 1 plate. English Summary pp. 149–150. [19 refs.]

iv. Forsius (R.). [**Ueber einen in Finland beobachteten Fall von Fanniasis (Myiasis) intestinalis. A Case of Intestinal Myiasis observed in Finland.**]—*Notulae ent.* Helsingfors. 1925. May 8. Vol. 5, No. 2. pp. 50–53. [Summarized in *Rev. Applied Entom.* 1925. July. Vol. 13. Ser. B. Pt. 7. p. 102.]

v. Greene (Charles T.). **The Puparia and Larvae of Sarcophagid Flies.**—*Proc. U.S. Nat. Museum.* 1925. Vol. 66. Art. 29. pp. 1–26. With 9 plates. [1 ref.]

vi. Tibaldi (E.). [**Miasi intestinale da *Sarcophaga Bekeri*. Intestinal Myiasis from *Sarcophaga bekeri*.**]—*Boll. soc. med.-chir. di Pavia.* 1924. Vol. 36. p. 365. [Summarized in *Med. Sci. Abstr. & Rev.* 1925. Apr. Vol. 12. No. 1. p. 64.]

vii. Lapie (G.). [**Venomous Caterpillars and the Urticarial Affections produced.**]—*Les Chenilles Venimeuses et les Accidents Eruciques. Paris: Libr. Sci. Nat.* 1923. 191 pp. With 4 plates. [Summarized in *Experiment Station Record.* 1925. Mar. Vol. 52. No. 4. p. 358.]

i. Case of half-grown larvae of *Musca domestica* passed, both per os and per anum, by a boy convalescent in hospital. Dr. L. O. Howard spoke of scores of cases of intestinal myiasis by this species correctly identified at the Washington Bureau during the last 10 or 12 years.

ii. A description and figure of the first stage of the larvae of *Dermatobia hominis*, with an appropriate introduction on some habits and hosts of the fly.

iii. Records the finding of larvae of Dermatobia in the skin of a jaguar in Surinam agreeing in all particulars with larvae of *D. hominis* found in man in Rio de Janeiro.

iv. Maggots identified as *Fannia scalaris*.

v. Descriptions and figured details of 41 puparia and 5 larvae of 41 species of Sarcophagid flies.

vi. The substance is summarized in the title, excepting the fact that the patient had previously been infested with *Taenia saginata*.

vii. Treats comprehensively of venomous and urticating caterpillars.

A. A.

Hirst (L. Fabian). **Plague Fleas, with Special Reference to the Milroy Lectures, 1924.**—*Jl. of Hyg.* 1925. July. Vol. 24. No. 1, pp. 1–16. [15 refs.]

In January, 1912, the author collected several hundred fleas from the rats of Colombo and sent them to Rothschild, who pronounced them to be of a new species, *Xenopsylla astia*. Up to that time Colombo had been free from plague, although there was no evident

natural reason for its immunity. (*X. cheopis* was not found in Colombo until January, 1914, immediately after the introduction of plague in cargoes of rice from Negapatam, and in the latest surveys here reported *X. cheopis* was strikingly abundant in just those parts of Colombo where the incidence of plague was heavy on rats and men, and was correspondingly infrequent elsewhere.)

In 1913 the author discovered that the rat-fleas of Madras—a city which, although plentifully infested with rats and not possessing any obvious natural peculiarities, also enjoyed remarkable immunity from plague—also were of the species *X. astia*.

These remarkable coincidences led him to surmise that light would be thrown on the epidemiology of plague by investigating the geographical distribution of *X. astia* and *cheopis*, and by comparing the natural capacity of the two species as carriers of the plague bacillus.

Cragg followed the matter up some years later in India (see this *Bulletin*, Vol. 19, p. 490), and in his extensive survey of Indian rat-fleas struck some remarkable instances of the freedom from plague of areas where the only rat-flea found was *X. astia*, and on the other hand, of the heavy incidence of plague where the prevalent species was *X. cheopis*.

As regards the comparative efficiency of the two species in Colombo, experiments already reported by the author had impressed him with the superiority of *X. cheopis*, and he now gives the bare results of further experimentation since 1921 which fully confirm that conclusion. Using 596 *X. astia* in a series of 13 experiments during 4 plague-seasons, he could not get a single transmission at room temperatures, although he did succeed in getting a transmission when the temperature was reduced (with help of ice) to about 70° F. On the other hand, using 132 *X. cheopis* in a series of 6 experiments, he transmitted plague to 12 rodents at ordinary temperatures. Several *X. astia* were found "blocked" with plague bacilli, but they could not be kept alive long or be got to bite; though a "blocked" *X. cheopis* was kept alive at least 15 days at an average temperature of 85° F.

The author attributes the superiority of *X. cheopis* largely to the circumstances that it feeds at longer intervals and bites much more persistently, and that it survives longer when "blocked."

His main general conclusions are: That "*X. cheopis* is the most effective transmitter of both epidemic and epizootic bubonic plague in all parts of the world"; and that the relative immunity of certain parts of India and Ceylon from plague is mainly due to prevalence there of *X. astia*, an inefficient plague-carrier, and only secondarily to climatic conditions. He believes that *X. astia* must have been the aboriginal rat-flea of India; that *X. cheopis* is a species of later introduction, by sea-borne trade, from which species the plains of Madras to some extent have been protected by mountain chains; and that unless precautions are taken, this most effective transmitter of plague will become established along the whole seaboard of Madras—with results.

In an interesting discussion on imported plague, the author emphasizes as a particularly dangerous attribute of *X. cheopis* that its larvae can be readily reared, quite independently of rat nests and of indirect assistance from parent fleas, entirely on the debris of grain, and so are peculiarly amenable to transportation in grain-ships.

A. A.

Williams (C. B.). **The Seasonal Prevalence of Fleas in Egypt.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 353–355. With 2 charts in text.

During three years' residence near Cairo the author has observed the seasonal occurrence of the fleas that trouble man there. They all have been *Pulex irritans*. In July-September they are very rarely seen; during October one or two may be seen, and they are still rare until the end of January, when there is a rapid increase up to a maximum in March-April, and then a fall to the rarity of July. The great increase of fleas thus occurs in the spring, when the temperature is rising and the humidity falling.

A. A.

Delanoë (P.). **Au sujet de la détermination spécifique des puces provenant des indigènes marocains. (Pour servir de contribution à l'étude de la Peste au Maroc.)**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 149–152. [2 refs.]

Every single one of several thousand fleas caught by the author in the years 1920–1922 on native Moroccans was *Pulex irritans*. Of 71 fleas taken by him from a casually-killed jackal black with these insects, 62 were *P. irritans*, 8 were *Ctenocephalus canis*, and 1 was a species that the author hesitates to place with Xenopsylla. From these and other observations the author concludes that *P. irritans* is the predominant flea of Morocco, and in that conclusion sees an explanation of the facts that in the Dukkala epidemic of 1912, (*a*) Sacquépee and Garcin could only exceptionally find an infected rat, and therefore inferred that infection was spread from man to man; and (*b*) infection was at once stayed by general anti-plague vaccination, and has not re-appeared. A report on the rodent fleas is promised.

A. A.

Suknev (V. B.). [**Organisation and Results of Observations in the Transbaikal Endemic Plague Region in 1923.**]—*Transbaikal Govt. Dept. Health Protect.* Chita. 1924. 80 pp. With 9 plates, 6 figs. & 1 map. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 85.]

The summary deals chiefly with the ectoparasites of the marmot *Arctomys bobac*, reputed to be the main source of plague in Transbaikalia. The ectoparasites specified are *Ceratophyllus silantievi*, *Rhipicephalus haemaphysaloides* (?), and lice. None of these parasites taken from infected marmots proved infective, nor were emulsions of Ceratophyllus infective except in an instance where the flea contained fresh (infected) blood, though emulsions of the lice are said to have been infective. Confidence in these experiments is not strengthened by the statement that they were not extensive enough to be considered decisive.

A. A.

i. Uriarte (Léopold). **Pulicidés des rats de Buenos-Aires.**—*C.R. Soc. Biol.* 1925. Mar. 20. Vol. 92. No. 10. pp. 831–832. [2 refs.]

ii. Pemberton (C. E.). [**The Rat Control Problem.**]—*Rept. Comm. Expt. Sta. Hawaiian Sugar Planters' Assoc.* 1924. pp. 25–26. Honolulu, 1925. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 86.]

iii. Jordan (K.). [**Siphonaptera collected by Rear-Admiral H. Lynes in Darfur in 1920 to 1922.**]—*Nov. Zool.* Tring. 1925. Apr. 30. Vol. 32. No. 1. p. 113. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 86.]

i. At the present moment, as 20 years ago, the prevalent rat flea in Buenos Aires is *Xenopsylla cheopis*; on "a large number" of rats (*M. decumanus, rattus,* and *alexandrinus*) 123 fleas were caught, of which 119 were *X. cheopis,* 3 *Ctenocephalus felis,* and 1 *Pulex irritans,* and five *X. cheopis* were caught from two rats from Santa Fé.

ii. Of nearly 3,000 fleas caught on dogs and cats in Hawaii not one was a rat flea.

iii. *Xenopsylla cheopis* was one of the species captured in Darfur.

A. A.

Delanoë (P.). **A propos de la puce du porc. Le porc hôte électif de la puce de l'homme. (Pour servir de contribution à l'étude de la peste au Maroc.)**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 191–199. [7 refs.]

Roubaud insists that mammals that have a naked skin, and particularly pigs, are attractive to human ectoparasites; the author confirms the observation of Bishopp that this is certainly so in the case of the human flea, *Pulex irritans.* In Morocco he has caught many hundreds of this flea in piggeries, and even in abandoned pig-sties, and in most of his instances it was the only species observed there. He, therefore, thinks that raising pigs in Morocco is a dangerous business, and ought to be supervised and controlled, seeing that *Pulex irritans* can transmit plague; and that by proper management the pig might be made use of for controlling the flea.

A. A.

Roubaud (E.). **Une nouvelle espèce de puce-chique pénétrante parasite des rats en Chine**: *Dermatophilus lagrangei* **n. sp.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 399–405. With 1 plate & 6 text figs. [1 ref.]

The species of Tunga (=Dermatophilus) here described comes from Shanghai, where it was found parasitic in the ears of a sewer rat (*Mus decumanus*). Only the female was available for description, and the specific characters emphasized are the absence of eyes and the curious form of the gravid abdomen, in lobules at the anterior end of which the head and thorax are embayed.

[In comparing this species with other species of Tunga (=Dermatophilus) and in describing it as new, the author has overlooked the eyeless species, found by Blandford, in the ear of a sewer rat at Ningpo in China, and described by Jordan and Rothschild, in 1921, as *Tunga caecigena* (see this *Bulletin,* Vol. 18, p. 205). The unique specimen of *T. caecigena* is a fragment, consisting only of a head (complete) and a thorax with a single leg; but the figure of the head and its appendages is suggestively similar to the same parts of the Shanghai chigger figured, though rather roughly, in the present paper.]

A. A.

v. Jettmar (H. M.). **Beiträge zum Studium der Pest unter den Insekten. I. Mitteilung. Die Tarbaganlaus.**—*Ztschr. f. Hyg. u. Infektionskr.* 1925. June 6. Vol. 104. No. 4. pp. 551–568. With 2 text figs. [32 refs.]

This is a long account of laboratory observations of the tarbagan-louse (*Linognathus* sp.), from which the following significant conclusions may be cited :—

Though the tarbagan-louse does not attach itself to an animal of another species for any length of time, it will suck blood from the souslik (Spermophilus), the guineapig, and man. On the death of its individual specific host it readily transfers itself to another such host, although it is able to remain alive, attached to hair, without food, for 10 days or more.

Plague bacilli ingested by the louse quickly multiply and fill the insect's stomach, the insect dying in 2 or 3 days ; virulent bacilli are found in the gut only, and the excrement consists almost exclusively of them. The dead louse, left in the light at room temperature and humidity, remains potentially infective for more than 13 days. Lice dead of plague can be distinguished by their dark red—or, by transmitted light, light-red—colour. Smearing the mouth-parts of the insect with virulent plague-culture did not render it infective. On one occasion a healthy Spermophilus became infected by a single transference of 40 lice from an infected tarbagan.

A. A.

Lécaillon (—) & Audigé (—). [**Sur les propriétés insecticides du Toluène.**]—*Ann. Epiphyties.* 1921. Vol. 8. pp. 19–25. Paris, 1922. [Summarized in *Rev. Applied Entom.* 1925. Apr. Vol. 13. Ser. B. Pt. 4. pp. 56–57.]

Bugs in a bedstead and crevices of a floor, lice on men and clothing, and fleas on dogs were destroyed by applications of toluene. The toluene appears to cause some irritation of the skin.

A. A.

Hutchinson (C. M.). **Micro-Anatomy of Cimex with Special Reference to the Technique of Insect Histology.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 487–498. With 3 plates.

The writer describes at great length his methods of fixation, clearing, embedding, and staining, also some detached histological observations of sections, mainly of gut of *Cimex rotundatus*.

A. A.

Mills (Ralph G.). **Some Observations and Experiments on the Irritating Properties of the Larva of *Parasa hilarata* Staudinger.**—*Amer. Jl. Hyg.* 1925. May. Vol. 5. No. 3. pp. 342–363. With 11 text figs. [14 refs.]

"In August and September of 1923 there occurred in Peking a number of painful cases of dermatitis, produced by a small yellowish larva that fed in great numbers on the shrubbery . . . The slightest contact . . . was sufficient to produce an extensive lesion, which usually lasted several days." The larva is the caterpillar of a moth,

and both are here figured. The lesion (figured) appears to be a superficial dermatitis spreading from a raised centre. The smart is severe, stinging or shooting, and is followed by paraesthesia, or numbness, and even by slight nervous disturbances.

The injury is caused by sharp-pointed spines scattered over the body of the caterpillar, not by the " so-called nettling hairs." These spines are hollow and contain protoplasm and a toxin.

The larva is well known to the Chinese as " Yang la tzu," or, less commonly, " Hui hua er."

A. A.

GORDON (R. M.). **A Note on Two Vesicant Beetles belonging to the Family** *Staphylinidae.—Ann. Trop. Med. & Parasit.* 1925. Mar. 31. Vol. 19. No. 1. pp. 47–52. With 1 plate. [7 refs.]

Notes on *Paederus amazonicus* and *P. sabaeus*, the former from Brazil, the latter from West Africa, with a reference to *P. cribripunctatus* from East Africa, and the Oriental *P. peregrinus* and *fuscipes*—all being small Staphylinid beetles emitting a vesicant fluid when irritated. The author here records a case, reported by Dr. WRIGHT, of Freetown, of severe conjunctivitis, with inflammation and swelling extending all round the eye and to the brow and cheek, caused by a small insect, believed with some probability to be *P. sabaeus*, accidentally lodging in the conjunctival fold. He also described the vesication —appearing after an interval of 18 to 24 hours—resulting from handling *P. amazonicus*; in this species minute drops of fluid could be seen exuding from the labium.

A. A.

i. WALCH (E. W.). **On the Trombiculae, Carriers of Pseudotyphus, and related Species from Sumatra. (2nd Part).**—*Kitasato Arch. Experim. Med.* 1925. June. Vol. 6. No. 3. pp. 235–257. With 26 figs. on 2 plates. [9 refs.]

ii. HIRST (S.). [**Descriptions of New Acari, mainly parasitic on Rodents.**] —*Proc. Zool. Soc. London.* 1925. Apr. Pt. 1. pp. 49–69. With 15 figs. [Summarized in *Rev. Applied Entom.* 1925. July. Vol. 13. Ser. B. Pt. 7. p. 100.]

iii. EWING (H. E.). **A Contribution to our Knowledge of the Taxonomy of Chiggers including the Descriptions of a New Genus, Six New Species and a New Variety.**—*Amer. Jl. Trop. Med.* 1925. May. Vol. 5. No. 3. pp. 251–265. With 4 text figs. [10 refs.]

iv. LARROUSSE (F.). **Contribution à l'étude des tiques de l'Annam; description de deux espèces nouvelles du genre** *Haemaphysalis*: *H. obesa* **n. sp. et** *H. lagrangei* **n. sp.**—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 301–305. With 3 text figs.

v. FERGUSON (E. W.). **Australian Ticks.**—*Rep. of the Director-General of Public Health New South Wales, for the Year* 1923. pp. 147–157. [49 refs.]

vi. DESCAZEAUX (M. J.). **Sur la présence au Chili de l'***Ornithodoros megnini.*—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 408–409.

vii. COWDRY (E. V.). **A Group of Microorganisms transmitted hereditarily in Ticks and apparently unassociated with Disease.**—*Jl. Experim. Med.* 1925. June 1. Vol. 41. No. 6. pp. 817–830. With 3 plates. [5 refs.]

viii. Root (Francis Metcalf). **Notes on Blood-Sucking Arthropods, collected at Tela, Honduras, and Port Limon, Costa Rica, during the Summer of 1924.**—*Thirteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1924. pp. 207–209.

i. To the Trombiculae already recorded by him from Sumatra (this *Bulletin, ante*, p. 300, and Vol. 20, pp. 473 & 800) the author now adds 2 new species that are notable as attacking man. These 2 species are described and figured, along with a table for the determination for the 5 Sumatran species previously described.

ii. Species from Africa. *Liponyssus bacoti* (a rat mite), and *Dermanyssus gallinae* (fowl mite) again reported as biting man.

iii. The "chiggers" described in this paper are not fleas, but larvae of velvet-mites (Trombidiidae).

iv. Six species of Ixodinae, including the two new species named in the title, are here catalogued.

v. A descriptive catalogue of the ticks of Australia. The author states that "too little is known . . . of the life-histories of Australian ticks."

vi. The Argasine ticks now known to occur in Chili are *Argas persicus* var. *porteri*. *Ornithodorus talaje*, *O. turicata*, and *O. megnini*. The last species lodges in the ear of calves (seldom of adult cattle) and sometimes of dogs; it is easily detached by a 3 per cent. solution of creolin.

vii. The micro-organisms here figured and described were found in 16 species of ticks. As the author says, many of them resemble the symbiotic fungi of the alimentary canal of certain blood-sucking insects (see this *Bulletin*, Vol. 15, p. 160), but differ in being situated in the Malpighian tubules.

viii. A list of species collected with casual notes on some of them.

A. A.

Chuhar Singh (Jemadar). **A Case of Snake-Bite** (*Echis carinatus*) **treated with Hypertonic Saline Solution intravenously.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. p. 511.

The patient was a young Pathan adult. He was bitten (10th June) on the foot, and he tied a pugri round his leg at once. When seen about three hours afterwards the bite was incised and treated with solid $KMnO_4$, and a stimulant mixture was given. About 13 hours later he was brought to hospital semicomatose, with profuse haemorrhage from mouth, nose and incision, and his condition did not permanently improve, or the haemorrhages cease until about $25\frac{1}{2}$ hours afterwards, though in the interval he received at intervals three hypodermic injections of adrenalin chloride and pituitrin and three intravenous injections of saline solution. It was not until the 5th day after the infliction of the bite that his condition was reported as good, and the wound as healing. He was discharged cured on the 10th day. Other symptoms noted were pain from the bite, slight ptosis continuing for about 12 hours, and abdominal pain. The snake was killed and identified as *Echis carinatus*.

A. A.

Sinderson (H. C.). **Snake-Bite in Iraq.**—*Edinburgh Med. Jl.* 1924. Nov. N.S. Vol. 31. No. 11. pp. 620–622.

The patient was an Indian of 28 years and of fine physique; he was bitten on the ball of the thumb by a snake accurately identified as *Echis carinatus*; little notice was taken of the bite, but for the continuous oozing of blood and the local swelling. About $6\frac{3}{4}$ hours afterwards he reached

a hospital; the forearm was then much swollen and excruciatingly painful and the man was coughing up bloody sputum; about 7 hours afterwards the swelling had increased, and there was haematuria and bleeding from the gums as well as from the bite. About 24 hours after this, the man was seen by the author; he was collapsed and there still was oozing from the injured thumb; the forearm was tensely swollen and very painful, and the axillary glands were inflamed. Thereafter, until the patient's death about 63¼ hours after the infliction of the bite, the wound continued to bleed, and haemorrhage also occurred from bowel, kidney, gums, and by sputum, as well as from any wounds made in the course of treatment. No antivenene being available, the author carried out appropriate treatment by local styptics and injections of horse-serum and calcium chloride, and by intravenous injections of hypertonic saline and cardiac stimulants as well as by saline injections per rectum.

A. A.

Blanford (H. O.). **A Case of Snake-Bite. An Unusual Incident in Sanatorium Treatment.**—*Lancet.* 1925. Mar. 14. pp. 543–544.

The patient in this case was a convalescent in King Edward VII Sanatorium at Midhurst. Taking his prescribed exercise, he was bitten by a lurking viper 2 feet long. The bite is described as a "minute scratch" between the knuckles of the index and middle fingers of the right hand. Within half-an-hour he felt faint and vomited, then had diarrhoea, and soon after that collapsed. About 4½ hours after the accident local "oedema" began, and this increased enormously and continued to spread until the 7th day, by which time it had involved arm, shoulder, jaw, back, buttocks, and left hip. Notwithstanding continuous treatment a second serious collapse occurred more than 24 hours after the accident. Pain seems to have been felt only as a result of the swelling. There was albumin in the urine; but no haemorrhages, beyond some subcutaneous ecchymosis, are recorded. The wound was scarified and rubbed with permanganate of potash within about half an hour, and the patient was kept in bed and treated with strychnine, brandy and saline infusions. The patient recovered, and it is stated that his original "pulmonary condition seemed in no way adversely affected." [It would be interesting to know whether it seems to have been improved.]

A. A.

Bouffard. **Un cas de mort survenue à la suite d'une piqûre par un serpent venimeux.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 126–127.

———. **Observation de morsure de serpent suivie de mort.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 353–354.

A case of bite by *Dendraspis viridis*, the victim being a strong and vigorous West African youth.

The patient when seen 4 hours after the accident was supine and completely paralysed, speechless and senseless, "as if mummified." The heart-beat was regular, 60. Nothing is said of any local reaction at the site of the bite. Twenty cc. of "antivenomous serum" (unspecified) were injected subcutaneously, but had no effect. Death occurred 7 hours after the infliction of the bite.

A. A.

de Magalhães (Octavio). **Hemiplegia organica provocada pelo veneno ophidico.**—*Sciencia Medica.* 1925. Apr. 30. Vol. 3. No. 4. pp. 302–307. With 3 figs. on 2 plates.

A clear and detailed account of a man, 24 years of age, who was bitten on the left ankle by a "cobra" [*i.e.*, a Brazilian venomous snake]. Three

days later he became suddenly hemiplegic, probably due to a capsular haemorrhage. He had shown haemorrhages elsewhere during the 3-day interval; the Wassermann test proved negative both with the serum and the cerebrospinal fluid. Antivenin was given and thereafter daily injections of strychnine and arsenic, and at the time of record the condition was improving.

H. Harold Scott.

RAIMUNDA (João Manoel). **Contribuição para o estudo dos chamados *segredos* contra a mordedura de cobras peconhentas.** [On Secret Remedies for Cobra Bites.]—*Arquivos Indo-Portugueses de Med. e Hist. Nat.* Nova-Goa. 1925. Vol. 3. pp. 125–162.

A most interesting and useful paper on the subject of snake-bite and its treatment by various popular remedies. The article is well worth consulting in the original, for space forbids our giving details of the numerous experiments carried out with many nostrums vaunted as cures for cobra-bite. Various plants and other "secret remedies" were tested on dogs, rabbits and guineapigs. They were first given the remedy alone to see if it produced any ill effects. In a second series the "remedy" was given immediately after a dose of the poison. Eight secret remedies were examined, and all proved absolutely useless. The plants submitted to test were *Glycosmis pentaphila, Tinospora cordifolia, Hemidesmus indicus, Zizyphus rugosus, Strychnos colubrina,* and *Zingiber casumunar.* All but the last of these proved also valueless. The rhizome of *Zingiber casumunar* given either subcutaneously or orally proved very efficacious; in many cases a fatal issue was prevented, in others when death appeared imminent life was prolonged for 2½ to 4 hours.

The author next wrote to various health authorities in different districts informing them of these facts and asking for their opinions and experiences of the same. The replies were uniformly favourable, the remedy being well known to all of them.

H. Harold Scott.

ANDERSON (L. A. P.) & CAIUS (J. F.). **The Effect of Storage on the Potency of Antivenomous Serum. I.**—*Indian Jl. Med. Res.* 1925. July. Vol. 13. No. 1. pp. 113–119. [9 refs.]

The following are the interesting conclusions of this paper, which records the results of experiments undertaken to determine the deterioration of Kasauli antivenom (Cobra and Russell's viper) in storage:—

"(1) This serum, like all other sera, gradually loses potency on keeping, during the first six to nine months. (2) A sudden increase in potency, to a degree higher than that originally possessed by the serum, follows the preliminary deterioration. The enhancement of potency is marked after 12–14 months' storage. (3) The enhanced potency of aged sera is not directly due to the particulate matter thrown down by ordinary centrifuging. (4) Light and heat, such as are represented by exposure in an ordinary room in the tropics, exercise no appreciable influence on the potency of antivenin."

A. A.

MARTIN (C. de C.). **The Effect of Formalin on Snake Venom. I. Diminution of Toxicity of Cobra Venom. II. Diminution of Toxicity of Daboia Venom.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 807–810. [5 refs.] & Vol. 13. No. 1. pp. 109–110. [1 ref.]

I. An academic study, showing that cobra venom incubated for 24 hours, at 37° C., in solutions containing commercial formalin suffers a reduction in virulence—as has been shown by other observers to be the case with diphtheria and botulinus toxin.

II. Tested in the same manner as cobra venom—*i.e.*, by incubating the venom solution for 24 hours at 37° C. with 0·25 per cent. formalin—the virulence of "daboia" venom was diminished, but not to the same extent as cobra venom.

A. A.

CAIUS (J. F.) & STEICHEN (A.). **Notes on the Concentration of Anticobra Serum. IV. Absorption Spectrum.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 499–501. With 1 plate.

The authors' conclusions from their experiments are that "the absorption spectra of normal horse serum and antivenomous horse-serum are identical and do not point to any essential difference between the two."

A. A.

DIAS (Ezequiel), LIBANIO (Samuel) & LISBÔA (Marques). [In Portuguese & English.] **Lucta contra os Escorpiões. The Struggle against Scorpions.**—*Mem. Inst. Oswaldo Cruz.* 1924. Vol. 17. No. 1. In Portuguese pp. 5–25. [25 refs.] In English pp. 27–44. With 1 plate.

The authors naturally limit the "struggle" to scorpions trespassing within houses, and remark that it can be evaded, or at least simplified, by constructing houses that do not attract scorpions. In experiments on a small scale they found that vapour of xylol, chloroform, naphthalin, coal gas, CS_2, SO_2, and HCN were as effective against scorpions as against insects. On a large scale for rooms and houses they had very satisfactory results with SO_2, and particularly with candles made of equal parts of sulphur and Chile saltpetre. They record a multitude of varied experiments, in one of which scorpions (and various other insects) enclosed in loosely-plugged flasks or wrapped in cloths, etc., placed in a closed cupboard in which 5 gm. of sulphur candle to the cubic metre of space was burnt were found dead when the cupboard was opened at the end of 24 hours. For fumigating rooms they recommend 10 gm. of sulphur and saltpetre candle to the cubic metre, and for fumigating an entire house 20 gm.—the place to be kept as much air-tight as possible for 24 hours. Of course, fumigation is only a temporary measure; a fresh invasion of scorpions must be expected, especially if there are stacks of firewood or rubbish about the house to attract them. By experiment the authors found that chickens are not only considerably immune to the venom, but also are extremely fond of scorpions; one of their chickens ate five in succession and wanted more. They therefore recommend chickens as auxiliaries. The troublesome scorpion of Central Brazil is *Tityus serrulatus*. It is incidentally mentioned that in the course of six years the Oswaldo Cruz Institute bought 107,533 scorpions for the manufacture of antivenom.

A. A.

Fretz (H. E. King). **Transient Glycosuria following Scorpion Sting.** [Memoranda.]—*Brit. Med. Jl.* 1925. Aug. 15. p. 294.

In Trinidad, whence the author writes, scorpion sting is a frequent accident. Of two common local species of scorpions, one small and brown, the other large and black, only the latter is dangerous—to adults as well as children.

The symptoms, which follow in about half-an-hour, begin with dyspnoea and spasms and pass into a state of extreme shock, with frequent vomiting, which state lasts for about 3 hours; thereafter recovery is gradual and usually is complete in 24 hours, death being rare. Sometimes epileptiform fits occur. Albuminuria is unusual; but in 12 out of 14 cases recently observed by the author glycosuria occurred, lasting from 2 to 5 days.

A. A.

Sharp (Neville Alex. Dyce). **The Treatment of Scorpion Sting.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 15. Vol. 27. No. 24. pp. 336–337.

The treatment here recommended for scorpion sting, as giving instantaneous and almost miraculous relief, is the local injection of an ampoule of novocaine and adrenalin. Of this treatment for the excruciatingly painful wound caused by the dorsal spine of a certain fish [possibly the Siluroid, Plotosus ?] also the author speaks most infallibly from experience in his own person.

A. A.

de Magalhaès (Octavio). **Contribution à la connaissance de l'action du venin des scorpions.**—*C.R. Soc. Biol.* 1925. June 12. Vol. 93. No. 20. pp. 35–37; 42–44.

The scorpion venoms (Brazilian) studied are of 3 species of Tityus (*bahiensis*, *serrulatus* and *dorsomaculatus*) and an unspecified Bothriurus. These venoms are, above all, neurotoxic, and have no effect on animals that do not possess a differentiated nervous system; they act both on the cerebrospinal and on the sympathetic nervous system—in the latter case causing diarrhoea, polyuria, and exciting other glandular secretions. The Tityus venom (*bahiensis* and *serrulatus*) is also haemolytic, cytolytic, proteolytic, and lipolytic. The sap of leaves (unspecified) and of dahlia tubers is said to have a feeble, and tyrosin a decided neutralizing power over scorpion venom. The fowl, turkey, cat and some snakes enjoy some degree of immunity, which, the author considers, is probably acquired. Also, according to this author, these scorpions are not immune to their own specific venom.

A. A.

Marcenac. [**Piqûres de scorpion au Maroc.**]—*Maroc Médical.* 1924. Dec. 15. [Summarized in *Presse Méd.* 1925. May 9. Vol. 33. No. 37. p. 621.]

A common scorpion in Morocco is *Heterometrus maurus*. Fowls feed on it. Its venom, which has a tetanizing action like strychnine, is sometimes mortal to children, but there is not enough of it to affect adults seriously.

A. A.

Campos (Oswaldo de Mello). [In Portuguese & English.] **Os escorpiões brazileiros. Scorpions of Brazil.**—*Mem. Inst. Oswaldo Cruz.* 1924. Vol. 17. No. 2. In Portuguese pp. 237–301. In English pp. 303–363. With 43 figs. on 14 plates.

A descriptive catalogue of the scorpions of Brazil—a valuable paper of purely zoological interest.

A. A.

Crutchfield (E. D.). **Dermatitis produced by the Portuguese Man-of-War.**—*Arch. Dermat. & Syph.* 1925. July. Vol. 12. No. 1. pp. 72–75. With 2 text figs.

This paper is based upon a case of dermatitis caused by contact with some species of Siphonophora which, to judge from the accompanying text-figure, is not the well-known "Portuguese Man-of-War" of the Old World.

A momentary contact caused excruciating pain, and produced wheals which even at the end of a week showed as streaks of hyperaemia and minute petechiae, or as linear blisters filled with bloody serum, and were visible after 3 months as deeply pigmented lines. Relief from pain was afforded by alkaline lotions and wet boric dressings.

A. A.

Herre (Albert W. C. T.). **Poisonous and Worthless Fishes. An Account of the Philippine Plectognaths.**—*Philippine Jl. Sci.* 1924. Oct. Vol. 25. No. 4. pp. 415–511. With 2 coloured plates.

A taxonomic and descriptive account of the Plectognathi (Hornfishes, Triggerfishes, Filefishes, Globefishes, Porcupinefishes, and Trunkfishes) of the Philippines, the flesh of which causes the disease known locally as *ciguatera*. In this disease "the nervous system is attacked and violent gastric disturbances, paralysis, and death may follow."

A. A.

Austen (E. E.). **A Contribution to Knowledge of the Blood-Sucking Diptera of the Dardanelles.**—*Bull. Entom. Res.* 1925. July. Vol. 16. Pt. 1. pp. 1–23. With 6 text figs. [4 refs.]

Barber (M. A.), Komp (W. H. W.) & Hayne (T. B.). **The Significance of the Proportion of Sexes found among Anopheles in Various Resting Places.**—*Public Health Rep.* 1925. Jan. 16. Vol. 40. No. 3. pp. 105–110. [2 refs.]

Bodenheimer (F. S.). **Ueber die Voraussage der Generationenzahl von Insekten. II. Die Temperaturentwicklungskurve bei medizinisch wichtigen Insekten.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Dec. 5. Vol. 93. No. 6. pp. 474–480. With 9 figs. in text. [6 refs.]

Buxton (P. A.) & Hopkins (G. H. E.). **The Early Stages of Samoan Mosquitos.**—*Bull. Entom. Res.* 1925. Jan. Vol. 15. Pt. 3. pp. 295–301. With 8 figs. [11 refs.]

Cleveland (L. R.). **Action toxique de l'oxygène sur les protozoaires *in vivo* et *in vitro*; son utilisation pour débarrasser les animaux de leurs parasites.**—*Ann. Parasit. Humaine et Comparée.* 1925. Oct. Vol. 3. No. 4. pp. 384–387.

Cooling (L. E.). **Seven Common Species of Mosquitoes described for Purposes of Identification.**—*Commonwealth of Australia Dept. of Health, Service Publication (Tropical Division).* No. 1. 24 pp. With 4 figs.

Cragg (F. W.). **Observation on the Reproductive System of *Cimex*: Impregnation.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 451–455. [3 refs.]

Evans (A. M.). **A New Variety of *Anopheles marshalli* Theobald from the Belgian Congo.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 211–213. With 2 text figs.

Grassi (B.). **Pesci nostrali antimalarici.**—*Rend. R. Accad. Naz. Lincei.* Rome. Classe Sci. fisiche, matemat. e naturali. 1923. May 20. Vol. 32. No. 10. pp. 511–513.

——. **Acclimazione delle Gambusie in Italia.**—*Ibid.* June 1. No. 11. pp. 544–548. [1 ref.]

Katsunuma (Seizo). **Présence de *Trichomonas vaginalis* dans l'urine d'un jeune garçon.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 216–217. [7 refs.]

Kofoid (Charles A.) & Swezy (Olive). **On the Number of Chromosomes and the Type of Mitosis in *Endamoeba dysenteriae*.**—*Univ. California Public Zool.* 1925. Jan. 28. Vol. 26. No. 19. pp. 331–352. With 27 figs. on 3 plates & 1 text fig. [20 refs.]

Lepine (Pierre). **Culture de *Trypanosoma lewisi* en différents milieux au sérum et au sang.**—*C.R. Soc. Biol.* 1925. July 24. Vol. 93. No. 26. pp. 523–524.

MacGregor (Malcolm E.). **Mosquitos under Winter Conditions.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 357–358. [1 ref.]

MacPherson (John). **Venomous Sea-Snakes.** [Correspondence.]—*Med. Jl. Australia.* 1924. Dec. 13. 11th Year. Vol. 2. No. 24. pp. 642–643.

Missiroli (Alberto). **I tubuli del Malpighi nell' *Anopheles claviger* ibernante. 1a Nota.**—*Ann. d'Igiene.* 1925. Feb. Vol. 35. No. 2. pp. 113–122. With 2 figs. on 1 folding plate. [3 refs.]

Pallary (Paul). **Comment recueillir les mollusques.**—*Arch. Inst. Pasteur d'Algérie.* 1924. Dec. Vol. 2. No. 4. pp. 564–566.

Pinto (Cesar). **Biologia do *Triatoma brasiliensis* Neiva.**—*Sciencia Medica.* 1924. Oct. 31. Vol. 2. No. 10. pp. 541–543. With 3 figs.

Puri (I. M.). **Studies on the Anatomy of *Cimex lectularius* I.**—*Parasitology.* 1924. Jan. Vol. 16. No. 1. pp. 84–97. With 12 figs. & 1 plate. [30 refs.]

Roubaud (E.). **Nouveaux diptères piqueurs de l'est africain.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 465–469. With 2 text figs. [4 refs.]

Shortt (H. E.). **Note on a Method of obtaining Stereoscopic Photographs of Entomological Subjects.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 339–340. With 1 plate.

Sinton (J. A.). **Notes on Some Indian Species of the Genus *Phlebotomus*. Part XIII. Methods of Collection and Preservation.**—*Ibid.* 1925. Apr. No. 4. pp. 801–806. [2 refs.]

——. **Notes on Some Indian Species of the Genus *Phlebotomus*. Part XIV. The Hypopygium of the Female *Phlebotomus*.**—*Ibid.* July. Vol. 13. No. 1. pp. 97–108. With 23 figs. on 2 plates. [12 refs.]

van den Branden (F.). **Contribution à l'étude de la répartition de l'*Ornithodorus moubata* dans le Moyen-Congo.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. p. 303.

Yakimoff (W. L.) & Miller (G. A.). **Les protozoaires de l'intestin des rats d'égout.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 311–312.

——[1] & Wassilewsky (W. J.). ***Oicomonas granulata* dans l'intestin des souris blanches.**—*Ibid.* pp. 310–311. [2 refs.]

REVIEWS AND NOTICES.

ROLLESTON (Humphry). [Bart., K.C.B., Regius Professor of Physic in the University of Cambridge; President of the Royal College of Physicians of London.] **On Writing Theses for M.B. and M.D. Degrees.** Second Edition Revised. 28 pp. 1925. London: John Bale, Sons and Danielsson, Ltd., 83–91, Great Titchfield Street, W. 1. [Price 1s. net.]

Since writing does not come to everybody as it did to neighbour Seacole, by nature, and since the medical curriculum provides no teaching in the business of professional authorship, the university candidate may give God thanks for this booklet on the art of writing theses for M.B. and M.D. degrees, now in its 2nd edition.

The author explains that a thesis must be a sustained argument based either on original observation or on original thought—not a mere compilation. It must have a well-defined scope, expressed in a strictly relevant title and concisely explained in an introductory statement. It should be introduced, further, by a succinct history of the subject proposed, and a statement of the appropriate material investigated and of the methods pursued in the investigation. All the essential facts and results of observation can then be set forth in their proper order and in their relation to the recorded observations of other authors, and after the facts the equitable conclusions from them. Tabulated detail can follow apart, and a list of *verified* references to the authors quoted. All this scaffolding of a thesis is a mechanical business, easily acquired; but the author also gives valuable advice in the more difficult matters of choosing a subject for a thesis and working-up the subject chosen, and much good counsel about literary style and its refinement by frequent sacrificial revision of the first fair draft. As models of style for the thesis-writer one would have liked to see the names of FIELDING and HUXLEY—two of our own clearest stars—in the author's galaxy.

A. Alcock.

BEATTIE (J. Martin) [M.A. (N.Z.), M.D. (Edin.), M.R.C.S., L.R.C.P. (Lond.), Professor of Bacteriology, University of Liverpool, etc.] & DICKSON (W. E. Carnegie) [M.D., B.Sc., F.R.C.P. (Edin.), Pathologist to the West End Hospital for Nervous Diseases, London, etc.]. **A Textbook of Pathology General and Special for the Use of Students and Practitioners.** Third Edition.—1103 pp. With 17 coloured plates & 499 text figs. 1925. London: William Heinemann (Medical Books), Limited. [Price, 42s. net.]

So large a treatise as this is (and the single volume edition is uncomfortably weighty) necessarily gives a fairly complete survey of pathology—general pathology and pathological anatomy and histology—though bacteriology and diseases of the female generative organs have been deliberately omitted on the ground that these subjects are dealt with in text-books of bacteriology and works on gynecology. The 499 text figures and the large and open type appreciably reduce, however, the actual amount of matter presented to the reader in the 1,100 pages of this third edition to within manageable limits!

A word of praise must be bestowed upon the illustrations: the text figures, whether of macroscopic specimens or of microscopic structures, almost always show what they are intended to, and some of the coloured plates, of which there are 17, are very beautiful, notably those on inflammation and repair. The arrangement of the matter follows stereotyped lines, the first half or so of the volume (Part I) being devoted

to general pathological processes, the second half (Part II) to a description of the diseases of the various systems and organs. Of the former, the chapters on inflammation and repair and on fever are notably good. Animal parasites, protozoan and metazoan, are somewhat fully dealt with, and the matter of this chapter is on the whole accurate and sufficient, but no reference is made to the wanderings of the larval *Ascaris* in the tissues, nor to the cyclopean stage of *Dibothriocephalus*. *Balantidium coli* is just mentioned as being "described as occurring in man and believed by some writers to give rise to diarrhoea."

In considering the subject of neoplasms, ADAMI's classification is adopted and a good summary is given of the various hypotheses of their genesis, though there is no mention of the Rous chicken sarcoma which (quite apart from recent work) is of considerable interest and importance in this connexion.

Certain conditions which merit some notice seem to have been forgotten, and we can find no account *inter alia* of rabies, Parkinson's disease, lenticular degeneration and myasthenia gravis. In connexion with encephalitis lethargica no reference is made to the herpetic viruses, in disseminated sclerosis there is no mention of the alleged finding of spirochaetes, and the changes in general paralysis of the insane are dismissed in less than a page.

The importance of iodine-deficiency in the genesis of goitre receives no mention, and we have found but two brief references to vitamins. In consequence, the discussions of the etiology of scurvy and of rickets are wanting and old fashioned. A lack of adequate revision is evident here and in other places, *e.g.*, in the reference to beriberi neuritis and the statement that Rose BRADFORD and his fellow workers have *recently* described a filter-passing organism in multiple neuritis (both on p. 1,015). A bare reference is given to haemoglobinuria in blackwater fever and in paroxysmal haemoglobinuria, no mention is made of the importance of the concentration of blood urea in gauging the significance and gravity of albuminuria and nephritis and all reference to renal efficiency tests seems to be omitted.

After all, it is easy to pick holes in a tome of 1,100 pages, and actually the blemishes we have noted are few and far between. The production of the work must have entailed enormous labour, and the authors are to be congratulated on the general excellence of the book.

R. Tanner Hewlett.

GAVIÃO GONZAGA (A.). [Inspector Sanitario do D.N. de Saude Publica. Chefe de Serviço na Directoria de Saneamento Rural.] **Climatologia e Nosologia do Ceará. Pagines de Medicina Tropical.**—172 pp. With 67 text figs. & 2 maps. 1925. Rio de Janeiro: Baptista de Souza—Rua da Misericordia, 51.

The first part of this book deals with the general topography and climatic conditions of Ceará. The country may be divided into three zones—the littoral, the elevated plains and the hilly districts of the interior. The climate on the whole is warm and dry; the mean annual temperature of the littoral is 26·1°, of the elevated plains 27·5°, and of the hills 20·7°. Rainfall is variable and irregular. Generally speaking, the plains register about half the rainfall of the littoral district. Vegetation suffers accordingly and climatic conditions are described as averse to white colonization.

The second part, dealing with the prevailing diseases of the country, is very interestingly written, though one would wish for more detail. Early records of yaws are not reliable since, as elsewhere, this condition was long confused with syphilis, but that they were regarded as not quite the same is evidenced by a quotation from a book written in 1864 describing a disease "very similar to the Neapolitan disease" which prevailed at Maranhão. Whether it is indigenous or of African origin is uncertain. It now constitutes a veritable scourge, as many as 60 per

cent. of the inhabitants of some parts of the highlands being attacked. The transmitter is believed to be a fly of the genus *Hippelates* which is very abundant and swarms on framboesial ulcers.

Venereal diseases—syphilis, soft sore, gonorrhoea and granuloma—are all prevalent and treatment most inadequate. The wide distribution of trachoma is ascribed to the low humidity, brilliant sunshine, sandy soil and excessive heat. Several insects probably take part in its dissemination, notably *Ophthalmomyia lacteipennis*, *Piophila casei*, and species of *Musca*, aided by the unhygienic manner of living. Inspection of children is being attempted and there is great hope of reducing the number of cases. The author states that helminthic affections in general and ankylostomiasis in particular do not constitute a serious problem as climatic conditions do not favour the evolution of the latter. Nevertheless, the average index of infection is 68 per cent. in the littoral district, 54 in the hills, and 32 in the plains.

Malaria is rather of intermittent prevalence, namely, in the rainy seasons and in certain districts, particularly the banks of the Jaguaribe, the Acarahú and its tributaries. *Plasmodium vivax* and *P. falciparum* largely predominate, the quartan parasite being rare. The only species of Anopheles seen are *A. argyrotarsis* and *A. albimanus*. Plague made its appearance in Ceará in 1900. No statistics are given, but the type would seem to be mild. Photographs of three cases, all children, are reproduced ; none appears to be seriously ill, and one is photographed standing up.

Tuberculosis, yellow fever, Chagas's disease, leishmaniasis (cutaneous and mucocutaneous) receive brief mention. The first case of yellow fever occurred in Fortaleza in 1851 and some twenty places are enumerated as endemic foci, but no figures are given except that in the period October, 1922, to June, 1923, there were 47 cases, of whom 23 died. In the following year a Commission of the Rockefeller Foundation took matters in hand. It is worth noting that during an interval of 30 years, from 1877 to 1907, no cases were recorded. Smallpox is said to be extinct. Leprosy is somewhat prevalent. 59 districts are mentioned from which there were 442 recorded cases in January, 1925. Fortaleza heads the list with 164, Jaguaribe-Mirim coming next with 36. In the author's opinion the total is probably about 800.

The book is well supplied with photographs taken by the author, but the majority have been indistinctly reproduced. The whole study bears evidence of careful observation, and is useful as indicating the variety of diseases which may be met with. The usefulness would be much enhanced if statistics of their prevalence were given and not merely a brief account of their history and existence.

H. Harold Scott.